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ABSTRACT

The ten elementary teacher education models have been summarized to fulfill a two-fold purpose: to provide information about the models to a broad audience of educators and citizens concerned with teacher preparation, and to provide a basis for comparing and contrasting new approaches to the preparation of elementary school personnel. The introduction presents background information on the Model Teacher Education Project, the systems approach, and the essential differences between the innovative models and typical present practices in teacher education. Each of the ten models is then summarized according to the following major topics: (1) Overview; (2) Major Themes; (3) Instructional Goals; (4) Overall Program Organization; (5) Curriculum Design; (6) Institutional Relationships; (7) Innovative Features; (8) Student Guidance; (9) Management and Control; (10) Placement and Follow-up; (11) Special Features. Also included with the document are a variety of illustrative diagrams and a list of related and available publications. (JES)

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Analytic Summaries of Specifications for Model Teacher Education Programs

System Development Corporation

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October 1969

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PREFACE

The ten elementary teacher education models have been summarized to fulfill a twofold purpose: to provide information about the models to a broad audience of educators and citizens concerned with teacher preparation, and as a basis for comparing and contrasting new approaches to the preparation of elementary school personnel.

A brief description cannot replace the original work, but it can direct the reader to those sections of the complete reports which warrant attention in relation to a particular situation. The summaries will have achieved their purpose if they provide the reader with this kind of a meaningful overview of the models.

A summary can be no stronger than its source document, but it should be no less strong. Each model represents a pattern of varying emphases, some aspects being thoroughly covered while others are scarcely mentioned. This unevenness causes difficulties in the preparation of summaries, and although a single format was used for all of the summaries, the reader may sense these variations in treatment. Similarly, it was early decided that references to omissions or the expression of editorial opinion would detract from the summary's purpose. For these reasons, only the point of view and the opinions expressed in the original documents have been reported.

As an aid to understanding the model's tone, the summaries depend heavily on words and phrases from the original documents, although a strong effort has been made to eliminate unnecessary jargon. When new terms are introduced, they are underlined and defined in the context. The summaries, however, have standardized the use of pupil, student, and teacher. In all instances, the pupil is the child who attends elementary school; the student is the college person preparing to teach; and the teacher is the certified individual working in the school. An intern would be a student working as a teacher but not yet having completed the model's training program. Clinical professors are found in some models; they are members of the school of education, but they may be working full time with interns at an elementary school.

To check the accuracy and readability of the summaries, each was read by the author of the model, the project director, and a group of consultants. Revisions were made as directed by these individuals. System Development Corporation is grateful to the following individuals who served as consultants to this project:

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The summaries represent a group effort by the Education Systems Department of SDC. The following individuals contributed to this volume: Dr. W. P. Kent, Dr. S. Epstein, and E. J. Bangiolo. Additional assistance was provided by Dr. B. Kooi and J. Bratten of the California staff.

Mrs. Judith Klatt has supervised the editing, production of graphics, and the typing. Her efforts primarily account for the success of this project.

The undersigned, however, is the director of the project and accepts the responsibility for any shortcomings of the document.

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Introduction

Teacher education has generally lagged behind the swift pace of change in American education, and, as innumerable critics have pointed out, teacher educators are a conservative group, satisfied with the status quo and the present patterns of teacher education. The field, however, has been buffeted by severe pressures--cybernation, curricular reform movements, technologies, behavioral psychologies, and systems theories--all pulling and pushing the fabric, frequently distorting its emphases, sometimes losing sight of its aims and goals. These tensions, operating in a traditionally conservative environment, cause conflict and confusion as the perhaps necessary concomitants of growth and change. While great progress has been recorded in improvements to parts of the process of teacher education, limited attention has been devoted to organizing these parts into meaningful, integrated, goal-directed programs.

Significance of the Models

The models represent the first deliberate efforts at developing comprehensive programs of elementary teacher preparation. Although many improvements in present programs have implemented such innovations as multi-media, simulated observations, improved subject matter preparation, and new courses in human relations, these changes have been piecemeal and fragmentary. New techniques and content have been fitted into the present operational framework or rejected out-of-hand. The present project has permitted the rethinking of the total program of teacher education and has provided a vehicle for exploring new integrating concepts and approaches. Each model examines the present program to determine its contribution to improving the interaction between a teacher and a child in the school setting. Program parts which do not relate to this interaction are discarded, but those traditional ideas and practices which are found still relevant are retained and incorporated in the new designs. While the models are sometimes radical, they are, nevertheless, grounded in the basic concepts of American educational practice.

Systems Analysis and Models

The U. S. Office of Education request for proposals called for the use of a systems analysis approach in the design of specifications for the models. Systems analysis should be understood in this context as a general term meaning an orderly approach for first defining a universe of interest, and second determining what changes in that universe will cause a desired effect. Systems analysis generally begins with the broadest statement of the universe and then subdivides it into components based on an analysis of functions and the interrelationships among functions. Each aspect of the system must relate to the achievement of the goals established for the system. In this respect, systems analysis is a process for relating a program or its parts to the goals envisioned for that program, for using information derived from operation to adjust the program towards its goal orientation, and for designing and selecting alternative approaches based on the particular characteristics of the operating environment.

The systems analysis process usually involves six major steps:

- Conceptualizing the system.
- Defining the parts or subsystems.
- Stating the objectives of the system.
- Developing alternative procedures for achieving the objectives.
- Selecting the best alternative.
- Implementing the system.

These steps, however, are not always followed in a straight line order. For instance, a decision to change the objectives of the system could require a change in the definition of the system or some of its parts.

Again, since elementary teachers will work in schools presenting a broad spectrum of differences, the profile of the newly trained teacher (in system terminology, "the product") will be determined by the nature of the educational setting. As the teaching environment changes, or as definitions of the teacher role change, the system will require adjustments at each step. This process of constant reiteration, based on information about the system's ability to achieve its goals effectively and efficiently, represents the great value of the system analytic orientation for this project.

Systems procedures emphasize processes rather than structures. Since teacher preparation and continuing education is a process relating directly to the college of education and the local school district (and a number of other institutions and agencies), effective channels for communication and interaction among these groups become necessary. Questions of assigning responsibilities to the various agencies, or of sharing resources and information, are re-examined as they affect the process of teacher education. One implication of this design requirement will be a lessening of the distance between the college and the school. An integral framework of responsibility will evolve, and all will contribute to the shared goal of producing quality elementary school teachers.

The Use of Behavioral Objectives

The models rely heavily on the specification of behavioral objectives as a basis for the selection of appropriate knowledge and experiences. Each model includes a description of the teacher's anticipated roles and functions in the changing school. This analysis of the teaching task into more or less specific groups of behaviors forms a basis for selecting both the academic and pedagogical content and the methods of practicing its application. Using behavioral methods in effect forces the question of relevance by showing direct relationships between the teacher education program and the teacher's classroom performance.

A behavioral objective states the specific actions, or uses of knowledge, which the student will be expected to perform as a result of a training experience. A list of significant behaviors is first derived from an analysis of the teaching process. The more specific this description, resulting from increasingly intensive analyses, the more specific the statement of behavioral objectives. When the behavioral objective has been stated, *criterion measures* are explicated to specify the kinds of tasks and information which the student will possess as evidence of mastering the objective. When a behavior can be easily analyzed, a behavioral objective and the relevant criterion measures are readily specified. The models indicate that most *single* teaching behaviors can be described in this manner. For instance,

BEHAVIORAL OBJECTIVE: KNOWLEDGE OF OBJECTIVE TEST CONSTRUCTION

ACTION:	The student will prepare a single page example of an objective test in a convenient subject matter.
CONDITIONS:	The student will be directed to design an appropriate format and to include at least three different types of objective items.
CRITERION MEASURE:	An acceptable test example will: (1) contain a title and specify the placement of the pupil's name and the date; (2) specify clear and complete directions to the pupil; (3) include at least three test-item examples such as true-false, completion, short answer, matching item lists, statements for correction, multiple choice, or problems;

(4) contain no misspelled words and no incorrect grammar.

As behaviors become complex, the statement of behavioral objectives and criterion measures becomes difficult. The analyses of behaviors presented in the ten models clearly indicate the difficulties encountered in trying to understand teaching processes. Some broad areas of teacher behavior can be analyzed, objectified, and described, so that criterion levels of acceptable performance can be stated. On the other hand, the models show that very little research evidence substantiates direct relationships between teacher training activities and role performance. Teaching remains an exceedingly complex activity, and a clear explication of some of the parts should not be taken to imply an understanding of the whole. Nevertheless, the models reflect the present state-of-the-art--in itself a valuable service--while they suggest important frameworks for further research and development.

If the whole of teaching cannot presently be derived from this behavioral analysis of its parts, important directions are nevertheless established for a process of increased control. For instance, if it can be demonstrated that teachers trained in the use of many audio-visual devices and their effective classroom applications are better able to select appropriate individualized learning experiences (presumably because they are aware of more alternatives), then this evidence recommends significant behavioral objectives for the teacher education program. Again, while the coping skills for dealing with some problem children in the classroom are not fully understood, certain teacher reactions (cynicism, ridicule, severe punishment) have been accepted as counterproductive. In this case, behavioral objectives might specify the elimination of these reactions (and their concomitant attitude structure) from the teacher's repertoire of classroom behaviors. This continuing process of analysis and conscious understanding of teaching behaviors forms a basis for training a teacher who will respond creatively to the teaching situation.

History of the Project

The Model Teacher Education Project was conceived during 1967 when the U.S. Office of Education, in selecting funding priorities, became increasingly aware of the need for improved programs of elementary teacher education. In August a group of consultants began to explore the feasibility of using large-scale project development techniques for planning elementary education. These processes would integrate the improvement of both elementary instruction and teacher preparation. This interest in large-scale and extended projects represented an emerging trend in the use of federal funds for research and development projects. This planning resulted in the issuing of a request for proposals on October 16, 1967, and by the target date of January 1, 1968, eighty proposals had been received.

The following statement prepared after the August 1967 planning meeting summarized the intent of the project:

> Any proposals developed for the program should include a rationale, a viable theory, specified objectives, and evaluational components. In addition, concern should be directed to individualized instruction, simulation, self study, the use of multi-sensory media, multiple approaches to the problem of educating elementary teachers, aspects of team teaching, realistic reality-testing laboratory experiences, built in development, demonstration and dissemination phases, built in systems and costs analyses, in-service education for all personnel conducting such programs, and the results should be transportable as models to other elementary teacher producing institutions. Since teachers have multiple competencies and multiple as well as sequential effects, proposals for such a program should be geared to how children learn and should also relate to how teachers aid the development of learning strategies and skills in children. Designs should be stimulated which demonstrate linkages with teacher education pre-service producers in addition to the input expected from education-related industrial and systems analysis corporations. It was assumed that the above elements could be implicit in certain kinds of models.

The project was planned in three phases. Phase I provided the funding to develop designs for nine model programs. Phase II of the project is now in progress. During this phase, limited to institutions which graduate at least 100 elementary teacher candidates a year, each institution will determine the feasibility of developing, implementing, and operating a model teacher training program based on the specifications produced in Phase I. The ten models summarized in this volume are the nine supported by Phase I funding, plus the Wisconsin Elementary Teacher Education Program which was developed independently, but which is receiving Phase II support.

The Phase I models, therefore, represent basic conceptualizations for a future-looking, change-oriented teacher education program. The Phase II feasibility effort will produce information on necessary resources and costs, management and administrative structures, needed research and development, and the implications of adopting such a program. Phase II project work began in May 1969 and will be completed on December 31, 1969. Phase III will involve the operation of several models as on-going programs of elementary teacher preparation. Present plans call for implementing at least three models as a test of their ability to achieve the goals of program improvement.

A First Effort

The ten models summarized in this volume represent a "first cut" at the redesign of teacher education. Indeed, such an effort would have been impossible even a few years ago because the development of total program designs required new skills and knowledge about the parts. During the past decade significant developments have occurred in learning theory, concepts of knowledge, school organization, and technologies for education. The next challenge requires the organizing of these educational improvements around new and sometimes radical approaches to program development.

Considerable attention is now being devoted to long-range educational planning and the use of predictive techniques. Coping with rapid changes requires programs of teacher education which can be responsive to new developments and which can prepare persons to teach effectively in new environments. The models are an attempt to deal with these kinds of challenges. In so doing, they provide a framework for productive thinking about future improvements.

A Generalized Outline

Each model was organized to facilitate the purposes of its creators, and as might be expected with any creative project, great diversity in both organization and content has resulted. Some models present principles as guides to action; others outline specific program elements. The treatment of program components varies according to the viewpoint taken by each model. One may present a thorough discussion of a management plan, but another may have felt that this area required little emphasis at this time. Nevertheless, each model succeeds in describing a program for teacher education.

The summaries in this volume, however, have been organized to follow a generalized outline covering eleven major topics, including:

- Overview
- Major Themes
- Instructional Goals
- Overall Program Organization
- Curriculum Design
- Institutional Relationships
- Innovative Features
- Student Guidance
- Management and Control
- Placement and Follow-up
- Special Features

While each model includes these major elements, or most of them, their treatment will vary widely. Under each heading, therefore, the summary follows the structure of the model, and sub-headings have been used which emphasize the individual approach. This outline was developed to aid the reader's comprehension and to permit easy cross-reference among the major topics. The reader desiring additional information will, of course, direct himself to the complete reports.

Contrasting the New and the Established

The significance of the models may be appreciated by contrasting them with present practices in teacher education. In so doing, two facts become clear. First, the models present a deliberate attempt to systematically plan the entire program. Second, many extant innovations, some of which may be found in present programs, are incorporated in an overall developmental framework. To emphasize these contrasts, a hypothetical description of a usual elementary teacher education program has been developed following the generalized outline developed for the summaries. Each reader, of course, will be familiar with innovations which render this description out-of-date. Nevertheless, the structure seems to reflect the contrasts between the models and current practices.

Twelve hundred colleges and universities prepare teachers for America's elementary schools, although 800 institutions account for over 90% of the graduates. Despite this huge number of institutions, one finds little diversity in program structure or goals. An undergraduate student pursues a four year program, receives approximately 124 semester credits or the equivalent, and, if an appropriate number of educational courses--including student teaching--have been completed, a provisional teaching certificate is awarded upon graduation. (A graduate without the necessary education courses can be certified by completing them as part of an M.A. program or through special certification programs).

The ten models envision elementary teacher education as a process of continuous training throughout the teacher's career. The Georgia model outlines alternative entry levels as part of a developing educational "career ladder," and Michigan seeks to shorten the time between the student's entry into college and his first professional responsibilities. Each model emphasizes the importance of a continuing in-service education program, usually planned in close conjunction with the local school district. The ComField group is attempting to separate the education leading to a degree and the professional preparation resulting in certification. While the processes may be coterminous, their purposes and goals are distinct. In general, the models are seeking new patterns for the organization of both pre-service and in-service teacher education.

Major Themes

Each model seeks to relate its view of the teacher, the school, the student, and the program to predictable trends and changes in both American society and education. All emphasize the continuing qualities of democracy and capitalism, but a few stress the vast changes in life being wrought by advancing technology. The school performs the dual purpose of maintaining society's values while preparing for life in a world of change.

The concept of the elementary teacher as a "generalist" overseeing the "self-contained" classroom is challenged by all ten models. Each sees the teacher emerging as a manager of the learning process. Michigan makes provision for supporting the teacher with aides and media specialists, the latter capable of producing and selecting appropriate learning experiences. ComField envisions the instructional manager of the present model supported by an instructional engineer and an instructional analyst, the three working as a team. The team concept emerges in various ways throughout the models.

The radical changes in the structure of elementary education require that the traditional format--six grades times two, staffed by a principal and twelve teachers, sometimes serviced by a library and a gymnasium, a familiar neighborhood landmark--be discarded. Some exciting changes--large group instructional areas, resource centers, computer terminals, individual study cubicles, teacher-pupil workrooms, and teaching material production centers--a new center of pupil, parent, teacher, community interaction--should be accepted as the new format of the future.

What happens to pupils in the school, however, is more exciting than these changes in teacher roles and building plans. New developments in psychology and curriculum organization, along with concomitant technological breakthroughs, are making possible the individualizing of instruction for all students. Instructional management systems make possible the control and adjustment of a pupil's program and free teachers to work with students at the creative level.

These emerging directions in elementary education are reflected by the models. Florida emphasizes academic preparation because the competent teacher must be a specialist in at least one teaching field. Syracuse, Toledo, and Michigan have developed program components to train teachers in the selection, control, and preparation of technology-based learning systems. Pittsburgh, Michigan, and Toledo have attempted to individualize teacher preparation through alternate program organization. The teacher developed by these models, while able to function in the present elementary school, will be prepared for a leadership role in the school of tomorrow.

Instructional Goals

Present undergraduate programs for elementary teachers usually have two goals: to graduate and to certify a person competent to work in the public schools. Accompanying this basic purpose are statements about the individual's acceptance of a professional role, contributions to scholarship, and participation in the life of the community. These programs, as a rule, operate independently of graduate or in-service programs.

The ten models have as their goal the preparation of a person who can function effectively in the elementary learning situation. The emphasis, however, varies. Florida emphasizes the cognitive domain, Massachusetts and Teachers College emphasize human-relation skills, Toledo emphasizes instructional procedures and technology, and Michigan emphasizes the behavioral sciences. Each model interrelates the goals of the pre-service and in-service programs and treats teaching skills as representing an ascending set of behaviors. Strong emphasis is placed on the total person and his well-being.

Overall Program Organization

Two curricular patterns have dominated elementary teacher preparation programs. The first includes an academic major-minor, general education as prescribed by the college, and special courses in educational foundations and teaching skills. The second program seeks to integrate academic content and pedagogy in a single series of courses covering elementary school subjects. Both patterns, however, include a period of student teaching preceded by other experiences working with children. The academic major-minor and elective courses may be taken outside the department of education, frequently beyond its ability to influence this work, and the student finds it necessary to comply with the requirements established by two or more college authorities.

Some models have changed this general pattern in radical ways, but others have found it generally acceptable. Florida and Georgia maintain the academic major-minor components essentially outside the school of education, while Michigan completely restructures the total program. The ComField model addresses itself only to the professional component, feeling that the rest of an undergraduate program is the responsibility of the college. All the models have questioned carefully the relationship between the program of study and the teacher's classroom performance, and each has carefully structured a series of experiences, simulated and actual, which precede the student's entry into teaching and continue to support his first efforts through in-service training.

The problems of time and course organization proved troublesome. If a model program is to be responsive to its educational goals in an effective and efficient manner, it should be free of the constraints imposed by a four-year program in which success is measured by the completion of a fixed number of Carnegie units. Each model reacted differently. ComField seeks to separate certification and degree requirements entirely, Michigan redesigned the whole educational program. Syracuse establishes minimum levels of achievement to be reached at the end of four years, but permits students to start at and progress to points which are individually determined. Georgia, sensing resistance from some sectors of the university, is undertaking planning studies to determine the consequences or removing time and credit requirements. This same concern has led Georgia, Syracuse, and others to plan a twelve-month school year, while Florida has planned to have its graduates return to the campus for each of the three summers following graduation.

The difficulties inherent in models based on achievement levels and operational proficiency, rather than on one-hour classes through eight semesters, imply grave consequences for the character of American higher education. Although each model deals with these issues, no one of them has found it possible to move entirely beyond the institution. The models do, however, present the kind of thorough systematic planning needed before such changes can be planned.

Curriculum Design

Traditionally, the basic curriculum unit has been the course. A two to four hour a week, semester-long segment is organized around some ascending order of difficulty within a complete program, but the organization of material during the course is determined by the professor or the textbook. Courses seldom include pretesting as an entrance requirement or the individual sequencing of experiences. Only infrequently are there direct ties between the academic study and the on-going world of the teacher.

Although some models retain the basic course organization with improvements, most of the models rely on the instructional module as the basic unit of curriculum. The module is organized around a single objective. A pretest determines the student's readiness to attempt the module, and remedial experiences are sometimes provided during it, or as a result of failure. The student paces himself, working as rapidly as his ability permits him to handle the material.

Each module specifies an instructional objective and criterion measurements. Prerequisite experiences, based on an assumed sequencing, are stated, but in most cases the student is permitted to skip modules by passing a pretest. Knowledge and experiences for study and practice are carefully described. The module may permit individual instruction or require attendance at a lecture, interaction with groups of students, or sometimes combinations of these groupings. Various techniques--CAI, sensitivity training, micro-teaching, simulation--are employed in the module. If the student wishes, provisions are included for discussing the module with a clinical professor.

Student teaching frequently offers the student his first formal classroom experience in present teacher preparation programs, and, since it is scheduled near the end of the professional sequence and the college program, students have little opportunity to apply their academic learning or to reflect on themselves in the teacher role. The models were particularly sensitive to this problem. Pittsburgh, Massachusetts, Syracuse, and Toledo have specified sequences of both simulated and real experiences for students. Georgia, through its role levels, provides a hierarchy of classroom experiences. ComField and Michigan are concerned that the student have adequate opportunities to work with children both in and out of school. Columbia, Michigan, and Syracuse use these experiences as a basis for personal guidance and self-growth by structuring a reference group and human relations training. Each model seeks to organize the student's experiences with children and in the learning situation from simple to complex, so that developing skills can be tested as the student grows in accepting himself as a teacher.

Institutional Relationships

The school (or department) of education has too frequently remained distant from the remainder of the university. Long-standing and occasionally important conflicts have engendered a separateness which neither group has found unsatisfactory enough to bridge. Similarly, there is not implied or explicit operational relationship between the college of education--the producer of teachers--and the local school district--the user of teachers. A resulting lack of communication has caused a disparity between the needs of the latter and the work of the former. Although innumerable efforts have been made to close these gaps, the lack of shared purpose and responsibility has impeded their effectiveness.

A radical change in this situation has emerged from the models. Syracuse, through the vehicle of the protocooperative group, has involved many local districts and other outside groups in the model's planning and operation. Florida has instituted the concept of the "portal school," an innovative school in each cooperating district whose faculty will cooperate in the design and operation of training experiences. The

ComField and Toledo models were planned by a consortium of groups including colleges, school districts, state departments of education, industry representatives, and professional and community groups. In all the models, a deliberate attempt has been made to improve communications among the groups responsible for preparing and using teachers and to develop patterns of mutual cooperation and benefit.

Innovative Features

Innovation and change have marked every area of elementary teacher preparation, and the observer would be hard pressed to discover any program unaffected by new developments. Indeed, as the reader familiar with teacher education first encounters the models and finds many familiar techniques, there may be strong temptation to pass them off as new statements of old ideas. This conclusion would be unfortunate.

The models make extensive use of new techniques and methods, some of which are presently leaving the research spectrum and becoming generally useful. Along with these innovations, the models present a framework for their use in deliberately planned, on-going programs of teacher preparation. In this sense, they represent an attempt at developing a balanced program through planning for change. It is this combination of planning methods and innovative ideas which makes the models particularly important.

Student Guidance

The field of college-level student guidance has been rapidly expanding to meet the changing needs of an increasingly diverse range of students. It is no longer widely accepted that the student will enter college with a sense of vocational goal and life ambition, and colleges now supply testing programs, counseling centers, and sometimes career guidance programs. Students in teacher preparation programs benefit from these services.

The student guidance programs developed in the models vary in their description of final services, their analysis of an acceptable student for the program, or their concern for the student's total plan of life. Florida specifies rather high standards of intelligence, health, and interest for admittance. By forcing early experiences with children, and then analyzing these experiences through seminar meetings, Michigan provides a regular career decision and role adjustment format. The ComField model outlines student decision roles in selecting content, experiences and sequencing activities. In general the models seek to make the guidance function an integral part of all program activity so the student, as he experiences himself relating to the teaching task, is supported by the group and the faculty.

Management and Control

Management and control activities may be viewed as responding to two conditions: the control of increasing kinds and amounts of information and an increasing number of decision points for evaluating student progress, modifying the program, and interrelating with additional sources of information. The models have met these challenges in different ways. Florida will use a Computerized Management System for handling all student and program information. Michigan is developing the capability to store its learning modules in the computer and to locate them by means of a natural language retrieval system.

Placement and Follow-up

A college placement office finds the first employment for the graduate teacher, and sometimes this office maintains a record for replacement. The teacher, usually because of state certification requirements, returns to a campus to finish either a master's degree or thirty hours of graduate study. Some colleges communicate with graduates for purposes of assessing the value of their preparation, but the practice is not general. Only rarely are there contacts between the student and the advisor after the student-teaching experience. The college of education, as a rule, feels its responsibility ends when the teacher has completed a degree.

Each model was required to integrate a program of pre-service and in-service education. The in-service program would support the beginning teacher through his first years of professional experience. In this manner continuity would be established through career preparation and early development. Placement is accomplished in the Florida model through the technique of the "portal school." Students will receive their initial experiences in these schools and stay for their first years of teaching. Consortia are being developed by Syracuse, Columbia, Michigan, and Wisconsin, and early teaching experiences will take place in these schools. Cooperating school districts will support the young teacher by participating in a regular program with the university. The clinical professor, a role developed by several models, places university personnel in the cooperating school to work with students and regular faculty. In each model a close relationship between the pre-service and the in-service experiences has been developed, and feedback from practice will determine needed changes in the pre-service elements.

Special Features

The models frequently suggest areas of concern which are not generally included within a program of teacher preparation. Most important among these is the need for retraining and upgrading of staff. New techniques of planning and providing learning experiences will require the development of new faculty skills by the college of education. Pittsburgh estimates that each staff member will require twenty hours of retraining. Syracuse and Florida outline procedures for training the clinical staffs. A related change will be the need for broad communication among the total university faculty. Georgia is planning new linkages as a result of the model. Wisconsin has traditionally viewed teacher preparation as a total university function. Indeed, all of the models have sought to unite the various elements of the university for effective planning of teacher education.

A Short Conclusion

This brief introduction seeks to emphasize the positive contributions of the models to the redesign of elementary teacher preparation, and, indeed, there are many. They represent the contributions of teams of scholars working on difficult problems, developing complete models of new programs. They incorporate new techniques of systematic planning and the use of behavioral objectives. Each model presents a storehouse of ideas which any institution would find valuable in the rethinking of its own program.

THE TEACHER-INNOVATOR: A PROGRAM TO PREPARE TEACHERS BY TEACHERS COLLEGE, COLUMBIA UNIVERSITY

Overview

A program based on this model is now being implemented at Columbia University Teachers College. Other schools of education will want to change various aspects of the model before considering its adoption. It is intended only as a heuristic device for suggesting some ways of thinking about the improvement of teacher education.

A program which seeks to prepare an innovative teacher must devote as much attention to developing the person's inner resources as it does to training his technical competence. Flexibility, commitment, and a secure self-knowledge become as necessary as a range of powerful teaching strategies and interpersonal skills.

The model will prepare educators who can help create and test new educational forms. For this reason emphasis is given to the teacher's roles as institution builder, scholar, and innovator, as well as the roles relating to working with children. The model illustrates a process for creating teacher education programs by providing an example of one designed to promote innovation and the scientific study of teaching.

Major Themes

Three major considerations underlie the development of new patterns of teacher education. First, a definition is required for both the kind of teacher the program is intended to produce and the appropriate methods. Second, since education is constantly changing and expanding, the teacher must be able to work under present conditions but be flexible enough to develop new aspects of the teacher's role. Third, teacher education is only a part of the student's university education, and it should complement the program of general studies.

Teacher education must be rooted in a commitment to educational change. The young teacher needs the cooperation of the existing school if he is to try out new educational procedures. He needs to know not only about the kinds of alternative educational forms that are developing, but what it takes to bring them into existence in the school.

To fulfill its commitment to improvement, a teacher education program has to be linked with schools and clinics where educational experimentation is the norm. The new teacher needs to observe and work with faculties who study teaching and learning and who carry out their work in a spirit of inquiry. He also needs training and support services long after his pre-service education has been completed. The world of education as a period of intensive training, followed by an in-service period in which training is less intensive or even haphazard, is not valid. An increasingly high proportion of the in-service time will be consumed by re-education and experimentation.

The new teacher enters a world in which there is uncertainty about the ends and means of education. New alternative models for curriculum and instruction are being created at a rapid rate. Social forces are rendering obsolete many aspects of present day education. The new teacher needs the skills for participating in the creation of new procedures and forms and their incorporation into school life. His education should prepare him to conceptualize new goals and to assemble the means for carrying them out. The teacher who would live rationally must be a competent scholar of teaching and learning.

As roles in education become differentiated, it will become possible to prepare teachers for a high level of scholarship. The specialist in computer simulation, for example, will be in a far more manageable role than is the multi-purpose school teacher of today whose role is too diffuse to permit mastery of performance, not to mention scholarship.

Powerful new training methods are developing within the field of teacher education, including microteaching, integrated feedback systems, simulation techniques for training in decision-making, and components which achieve interpersonal flexibility in teaching. It is still difficult, however, to develop fixed performance models, because teaching remains an exceedingly complex activity.

Instructional Goals

The primary purpose was to develop a broad performance model of the professional educator and a structure of teaching that would permit the creation of the ends and means of a teacher education program. The basis of the rationale stems from the idea that professional performance can be described in terms of control over certain areas of reality that are essential to develop creative roles, rather than the ability to fill already-defined teaching roles. The selected areas of reality would enable the teacher to work as a creator. This concept obviates the problem of developing static performance models based on existing studies or limited visions.

Professional performance in all walks requires control over certain areas of reality. This model seeks to create a program for producing a professional teacher who will grow in capacity, create new options for children, and contribute to his profession. Conceiving professional functioning as the creative manipulation of reality puts future growth in a central position.

The first stage in the creation of a program of teacher education is the identification of the areas of reality which the teacher should control if he is to function effectively with children, create new educational forms and bring them into existence, and participate in the quest for knowledge about teaching. The second stage is the development of curricular systems which will enable teacher education students to achieve control of the essential areas of reality. These are the purposes and goals of the present model.

The Four Roles of the Teacher-Innovator. Four roles were identified which seem essential for the teacher who is an innovator and a scholar. Within each role, certain kinds of control appear necessary.

- The Institution-Builder. (Shaper of the School). The teacher-innovator works with other faculty members, community representatives, students and administrators to design complete educational programs and organizational structures to bring them into existence. The shaper of the school controls strategies for studying and designing curricular systems, analyzes and creates effective social systems in the school, and assembles and employs technical support systems which facilitate education.

- The Interactive Teacher. The most familiar teaching role occurs during contact with children. At that point the teacher needs strategies for making instructional decisions which are tailored to the characteristics and needs of the pupils. He can work with groups of children to build effective democratic structures through which they can conduct their education. He controls a wide variety of teaching strategies and wide range of technological aids to education. He is a student of individual differences and he has the interpersonal sensitivity to touch closely the minds and emotions of the pupils and, in response, to modify his own behavior as a teacher. He is able to bring structure to chaotic situations without being punitive. The teacher does this in company with his colleagues.

He rarely works alone--partly because he is more effective when teamed with others, but also because he needs their support and the shared analysis of teaching and learning that is a continuous part of their professional life. With them he controls techniques for designing continual small experiments in teaching and learning.

The Innovator. To be an innovator rather than a bureaucratic functionary a teacher needs to combine personal creativity with ability to work with others to build educational settings in which innovation rather than imitation is the norm. He should have techniques for analyzing the social structure of the school, especially for determining how it inhibits or facilitates creative behavior.

The Scholar. The teacher cannot be expected to perform his duties effectively forever on the basis of his original training. Continuous scholarship renews him and adds to his knowledge about education. He controls techniques for studying the processes of interactive teaching and theories of learning. He specializes in one discipline until he knows the nature and the modes of inquiry of that discipline. Equally important, he knows how to engage in research that relates that discipline to the lives of young children. He controls structures for studying the school and for studying teaching and learning, so he can design and carry out educational experiments. He masters a range of teaching strategies derived from different views of learning, and more important than that controls techniques for developing and testing new ones.

Overall Program Organization

The definition of four future-oriented roles--the Interactive Teacher, the Institution-Builder, the Innovator, and the Scholar--became the sources for the structure of the Columbia program. Two frameworks were then developed. One consists of general procedures which unify the program and are shared by all of its components. The second consists of four components, one developed around each of the four roles of the teacher-innovator, and each of them designed to yield control over the areas necessary to that role. The four major components are interrelated and overlapping. They are dimensions of the program, rather than isolated compartments. Each, however, has its distinct rationale and organization.

The General Methodology and Structure.

The basic teaching strategy in the program is cooperative inquiry. The teacher candidates are organized into democratic "inquiry groups" of about twelve students. These miniature democracies are assisted by faculty counselors who help them to educate themselves. The substantive components have all been designed to be virtually self-administering. In no activity is a faculty member more than a seminar leader. The structure of each component is explained to the inquiry group which then, with the help of the faculty, negotiates its way through the activities.

Within each inquiry group the candidates are organized into feedback teams. Each feedback team consists of three or four teacher-candidates who coach each other when they are learning skills to help analyze one another's teaching and to carry out small educational experiments throughout the program. These two units, the inquiry group and the feedback team, are kept together as much as possible throughout the teacher education program so that members of the group share the commitment to experimentation and support one another in new activities and experiments.

The Contact Laboratory. The second general structural element in the program is the contact laboratory, which refers to provisions for the teacher candidates to be in contact with schools or children. After an initial period of apprenticeship in the normal public school situation, the contact laboratory does not use or employ any experiences which are analogous to those which usually characterize student teaching. Contact is provided, however, in order to give the teacher candidates the opportunity to study schools, teachers and children, and also so that they can master a wide repertoire of teaching strategies, practice making curricular and instructional decisions, and engage in educational experimentation.

After substantial training, preferably in small-group teaching in their own specialty, teacher candidates are attached to teams in the Inquiry School in order to carry out fairly lengthy experiments. Finally, they are placed in public schools as interns, preferably in assignments where three of them cover the normal duties of two teachers, so that the three can work together continuing to carry out experiments. (It probably should be noted at this point that the view of this model is that all teaching is an experiment and that the only honest approach to teaching is to treat each educational activity as the testing of a hypothesis about teaching and learning.)

The contact laboratory is best described in six phases, each of which serves the four basic components simulatenously. Briefly, these phases are:

Phase	Type	Purpose
Phase One	Experiencing the School.	A four to eight week apprenticeship to a public school.

Phase Two	Small-Group and Tutorial Teaching (Preferably in Candidate-Operated Program).	Ten to twenty weeks of experimenting with teaching strategies.
Phase Three	Unit Experimentation in Inquiry School.	Group experiments in teaching units taking four to eight weeks.
Phase Four	Experience in Curriculum Modes in Inquiry School.	Observation-participation experiences in a variety of ways of teaching.
Phase Five	Carrying on an Educational Program.	Inquiry groups develop and carry on a candidate-operated school program.
Phase Six	Internship	Paid teaching, preferably in teams derived from inquiry groups.

The contact laboratory begins in the first weeks of the program and ideally continues into the first year of paid teaching. Only the initial phase includes apprentice teaching of the type most familiar in traditional student teaching programs. The remainder of the experience is in experimental teaching in which the candidates master a variety of strategies and carry out teaching units which they have developed.

The Differential Training Model. The third structural element is a model for individualizing instruction which is based on the work of David E. Hunt of the Ontario Institute for Studies in Education. Hunt has taken the position that an optimal educational environment can be prescribed for individual teacher candidates which functions in two ways. First, it will increase the learning of ideas and skills. Second, it will increase the personal flexibility of the teacher candidate. Hunt's model provides for modification of educational procedures to take into account four characteristics of the teacher candidate: his competency level, feedback preference, value orientation, and cognitive orientation. All of these characteristics are related to achievement by the teacher candidate. Cognitive orientation is related to personal flexibility.

The components are organized so that pacing by competency level is accomplished in the skill areas through procedures that the candidates administer directly to themselves. For example, a candidate needs to practice a teaching strategy only until he has mastered it. The means for determining mastery are built into the component in which teaching strategies are the central concern.

The other aspects of the differential model are carried out by the action of the faculty member as he works with the inquiry group. Basically, he modifies his role in order to change the educational environment that is presented to the candidates. With respect to feedback preference, for example, the faculty member modifies his behavior so that candidates who prefer feedback from authority figures receive much from him or other faculty, whereas candidates who prefer peer feedback receive less authority feedback and more feedback from peers.

With respect to cognitive orientation, the faculty member modifies the amount of structure and task complexity that is presented to the teacher-candidate. For example, candidates of low cognitive complexity operate best in environments which are fairly well structured and in which task complexity is not too great. Highly complex individuals, on the other hand, operate best under low structure and high task complexity. Hunt's theory suggests that when there is a substantial mismatch between cognitive complexity and the environment, the individual not only does not achieve as well but he also is unlikely to grow in flexibility. An optimal environment for growth in flexibility is one in which the amount of structure is somewhat less and the amount of task complexity is somewhat greater than what is optimal for achievement. In other words, a slight, controlled mismatch has the effect of pulling the individual toward ever increasing cognitive complexity and flexibility.

The cooperative inquiry program is operated as a democracy with small self regulating units of students monitoring their own progress and administering the program to themselves with the assistance of faculty counselors. The faculty counselor modifies his roles to provide an optimal educational environment for each individual according to the differential training model. The contact laboratory is organized to provide the teacher-candidates with opportunities for study, microteaching, and experimentation rather than to mold them to fit the school as it presently exists. The contact laboratory stretches over a long period of time in order to insure the development of realistic skills, but it is designed to discourage the teacher-candidates from believing that "realism" means accepting the school as it is today and keeping it the same.

Curriculum Design

Four components define the dimensions of the unified program. The contact laboratory serves all four components, sometimes through the same activity.

The Interactive Teaching Component. Since the professional self-concept of the teacher depends on his belief in his capacity as an interactive teacher, this area requires the greatest attention. No matter how well he is able to study education and build institutions, he will not feel adequate unless he can teach well. This component, therefore, is the most precise and requires the most definite standards of performance. Four subcomponents focus on different aspects of teaching.

- Instructional Decision-Making Subcomponent experiences proceed from simulation to reality. The objectives are to impart knowledge of the interaction between teaching strategies and the characteristics of learners within an educational milieu: to relate knowledge of strategies to particular areas of specialty; and to practice creating, executing, and defending the selection of teaching strategies. There are two levels to the strategy of this subcomponent. One immerses the teacher candidates in a situation of making, defending, and revising educational decisions. The second operates to teach substantive processes for making decisions in an action context composed of real and simulated problem situations. Two simulated settings for decision-making are employed. This subcomponent later merges with the Institution Building component.

  There are three phases. In Phase I, the inquiry group becomes acquainted with means and objectives and makes plans for administering the subcomponent. In Phase II, the inquiry groups tackle problems in the simulated school and study strategies for making and carrying out instructional decisions. Phase III involves tutorial-small group teaching. Feedback teams practice teaching real children, making instructional decisions, rationalizing them to one another and testing their teaching strategies. This merges into the Models-of-Teaching subcomponent.

- In the Models-of-Teaching Subcomponent, the teacher candidate masters a basic repertoire of moves or maneuvers which he can use to carry out a wide variety of teaching strategies. The maneuvers of teaching are those behaviors which the teacher controls to induce student reactions that will lead to learning. He also learns a representative sample from the spectrum of theoretical positions about education and how to translate these into teaching strategies. Provision is made for the teacher to master four teaching maneuvers that are the basis for a wide variety of teaching strategies, and to master nine basic strategies which represent widely known theoretical models of education.

The objectives are to train the teacher to discriminate among the four basic maneuvers, to demonstrate an example of each of them, to identify nine teaching models and their underlying theoretical positions, to build and execute lessons utilizing each of the nine strategies, to identify a basic repertoire of strategies for the teacher, to learn to carry them out using contemporary technical support systems, and to have each teacher develop and test a model and strategy for himself.

This subcomponent begins by the organization of the inquiry group and the explanation of the phases and the objectives which have been prepared beforehand. The first phase is the learning of the basic maneuvers of teaching, the second phase is learning nine basic strategies of teaching, the third phase is the practice of teaching strategies within a curriculum area, and the fourth phase is the development and execution of original models. Evaluation is accomplished through the monitoring by each feedback group of the progress of its members.

The Flexibility Training Subcomponent attempts to help the teacher become sensitive to the world of the child and particularly to the way that the child processes information about the world and reacts emotionally to encounters with it. It includes the capacity of the teacher to modify what he is doing in order to accommodate the system of the learner. A method for assessing the interpersonal sensitivity and flexibility of a teacher as he is interacting with the learner is used. The objectives are to discriminate cognitive, affective, and competency cues from the learner, to experiment with teaching behavior to achieve the foregoing, and to experiment with teaching maneuvers designed to increase knowledge of the learner.

Phase one consists of role playing encounters, phase two establishes learning tasks, and phase three carries out learning tasks. Phase four, which is the heart of the subcomponent, includes discrimination training, goal setting, practice, and feedback.

Evaluation requires evidence of behavioral changes in relation to objectives. Evidence may be collected in role playing simulations which may be more successfully standardized than classroom situations.

The Social System of the Classroom Subcomponent surveys one of the most important aspects of interactive teaching--helping children to develop a social system and a sense of community. The teacher must study the activity pattern of the classroom, develop teaching strategies varying in amount of structure to fit the social pattern, analyze the effects of his teaching strategies on the social behavior of the children, and help other teachers analyze their teaching strategies in terms of social structure.

In the first phase of this program, the student teacher learns the techniques of discovering the unique social characteristics of each classroom. In the second phase he learns to discriminate the amount of structure in a teaching strategy. The objective of the third phase is to carry out a number of teaching strategies which will present a range of structure. The fourth phase requires the teacher to select strategies of different structure or create them following his analysis of social needs of the pupils in a given natural situation. In the fifth phase, feedback teams prepare a plan for teaching, carry it out, and analyze its effects on student behavior. The sixth phase is a unit experiment in the contact laboratory. The inquiry group develops an experiment and plans for the development of a classroom social system. As the unit progresses, they analyze the social situation and revise the strategies they are using. In the seventh phase, a teacher helps other teachers to analyze their teaching strategies in terms of the social dimension and assists them in assessing the effects of that dimension on the social behavior of their pupils. This phase is an internship or in-service phase and assumes that a school is a center of inquiry in which teachers work together.

Institution Building. This component has the objectives of teaching the major theoretical positions on the shaping of the school and the procedures for developing organizations. It is concerned with organizational skill, mission development, fitting an educational institution to its community, organizing technological support systems, and developing the social system of the school.

The first phase takes place in a simulated school using a set of fourteen retrievable data files for each of three simulated communities. Each of the communities differs from the others in its form of social, political and economic life. Such differences should enable trainees to explore ways in which community characteristics can be used in developing curricula. A problem task which requires institution shaping activity is set up. Seminars on institution building strategies alternate with activities in the simulated school. The second phase studies models of teaching and includes a seminar dealing with the question of curriculum modes. The third phase is a study of curricula and instructional strategies in one curriculum area. In phase four, the inquiry group is assigned to a specific phase of activities in the remedial school and carries out its work with assistance from a faculty counselor. In the sixth phase, the feedback teams are apprenticed to the school as a center of inquiry to study institution building activity and receive coaching from the school's staff.

A faculty counselor is assigned to each inquiry group throughout the component. Other faculty members, assisted by advanced students working as interns, can staff the simulated school. Evaluation and feedback are carried on in terms of solutions to institution building problems.

The Teacher-Innovator. This component is concerned with the processes by which the person frees his ability to create and to venture into new terrain. There is no hard sequence of behavioral objectives to be achieved one after another. Instead, there are general behavioral goals toward which one works slowly and through a variety of means. Accordingly, it is difficult to establish, for evaluation purposes, a cause and effect relationship between particular educational activities and particular outcomes. There are two very general goals. One is to understand institutional processes and the social structure of human institutions. The teacher must understand the alienation caused in himself when bureaucratic roles interfere with his teaching and he must know how to influence group norms so that they support innovative activity. He must be willing to experiment and disclose the results of his experimentation to other persons. The second goal is to achieve flexibility, particularly an interpersonal flexibility which can be defined in terms of changes in cognitive orientation or levels of integrative complexity.

The first goal is achieved by assigned readings, several weeks of work in a school setting with feedback teams, and participation in the operation of enrichment, remedial and summer schools. Flexibility is achieved through some of the activities in the Institution Building and Interactive Teaching Components.

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The Teacher Scholar. This component involves "Studying the World of the Learner" and "The Study of Teaching." Studying the world of the learner focuses on the processes by which the teacher studies individual differences in human beings and relates what he finds to the development of teaching strategies. The student will master at least two theoretical models of human development or learning; then he will apply these to studying individual differences among children and to making judgments about teaching strategies that will help children grow in particular ways. This will be done both through inquiry group studies of theory and research in the domains selected, and through small-scale research during the tutorial phase of the contact laboratory.

In the study of teaching subcomponent, the student teacher analyzes teaching and learning in such a way that the behavior of the teacher as he interacts with the learner can be conceptualized and related to the behavior of the learner. The process involves acceptance of a behaviorist point of view. The component is designed to give teachers research skills that they can apply to their own teaching and to the teaching of their fellow students. There are four phases. During phase one, students work in feedback teams, and tutorial and small group teaching situations are arranged. In the second phase, candidates begin to engage in the study of particular problems and generate their own systems for finding solutions as they go along. The chief activity in the third phase is the application of various systems in the study of teaching strategies. The fourth phase occurs parallel to the third. Behavioral analysis in the teaching laboratories is used to help teachers analyze and improve their behavior. Generally, the activities begin with a problem.

Institutional Relationships

This model does not specify relationships with other organizations in great detail. The elementary school known as the Inquiry School where the Contact Laboratory, practicums, and internships are established is the main institution related to the school of education and its teacher education program.

The Inquiry School is envisioned as a place where superior learning takes place and where processes of learning and teaching are studied continuously. It serves as a setting for the laboratory work of the teacher candidates who need to practice institutional shaping activities. It is designed to be a model teaching-learning center and a center of inquiry which will guide teacher candidates when they attempt to develop educational institutions themselves.

In the Inquiry School, in-service education is not something piled on to the ordinary activities of the teacher. Instead, the continuing components of the teacher education program are natural and even necessary correlates of teaching and learning.

Such a school may operate with master teachers who have large subordinate staffs to help them accomplish their functions, or it may be organized into teams each of which performs specific educational tasks which are highly specialized.

Innovative Features

Among the innovative features of the Columbia model is the democratic method of training, in which students largely direct their own educational experiences and sequences. The model also features differential training, which matches training procedures to individual students and shows teacher candidates how to individualize education. It takes into account the achievement level, cognitive orientation, value orientation, and motivational orientation of the student in designing curricular experiences for him.

The four major subdivisions of the curriculum are a major facet of the program. While the interactive teaching component is not entirely new (although it contains some new characteristics), the institution building, innovator, and teacher scholar components are departures into new areas.

Selected elementary schools are used as inquiry schools for training new teachers and as trial grounds for new teaching techniques. Students thus have the advantage of a place to acquire experience, and the schools benefit from early application of improved techniques.

The nine teaching strategies and "models of teaching" based on various theoretical positions of behavioral scientists constitute an important aspect of the Columbia model.

Student Guidance

A faculty member serves as a general advisor or counselor to help the student teachers to educate themselves. The students monitor their own progress and administer the program to themselves. The faculty counselor acts as a seminar leader and advisor who modifies his role to provide an optimal educational environment for each individual according to the differential training model and according to the cognitive structure of the student himself.

Guided by the faculty counselor and the steering committees, the members of the student inquiry groups help each other in using the contact laboratory aspect of the inquiry school and the facilities of the school of education to study and engage in micro-teaching and experimentation.

Because of the organization into inquiry groups and feedback teams, the students administer a considerable portion of the required counseling and guidance to each other.

Management and Control

Since the model was conceived as a heuristic device to aid thinking about teacher education, it has not delineated a management and control system. An administrative system, however, has been implied through the definitions of the inquiry groups, the feedback teams, the counselors and steering committees, the inquiry school and contact laboratory, and the differential training models. Institutions which consider adopting the model will fit these devices to their administrative structures.

Figure 1 is a conceptualization of the Teachers College Instructional System.

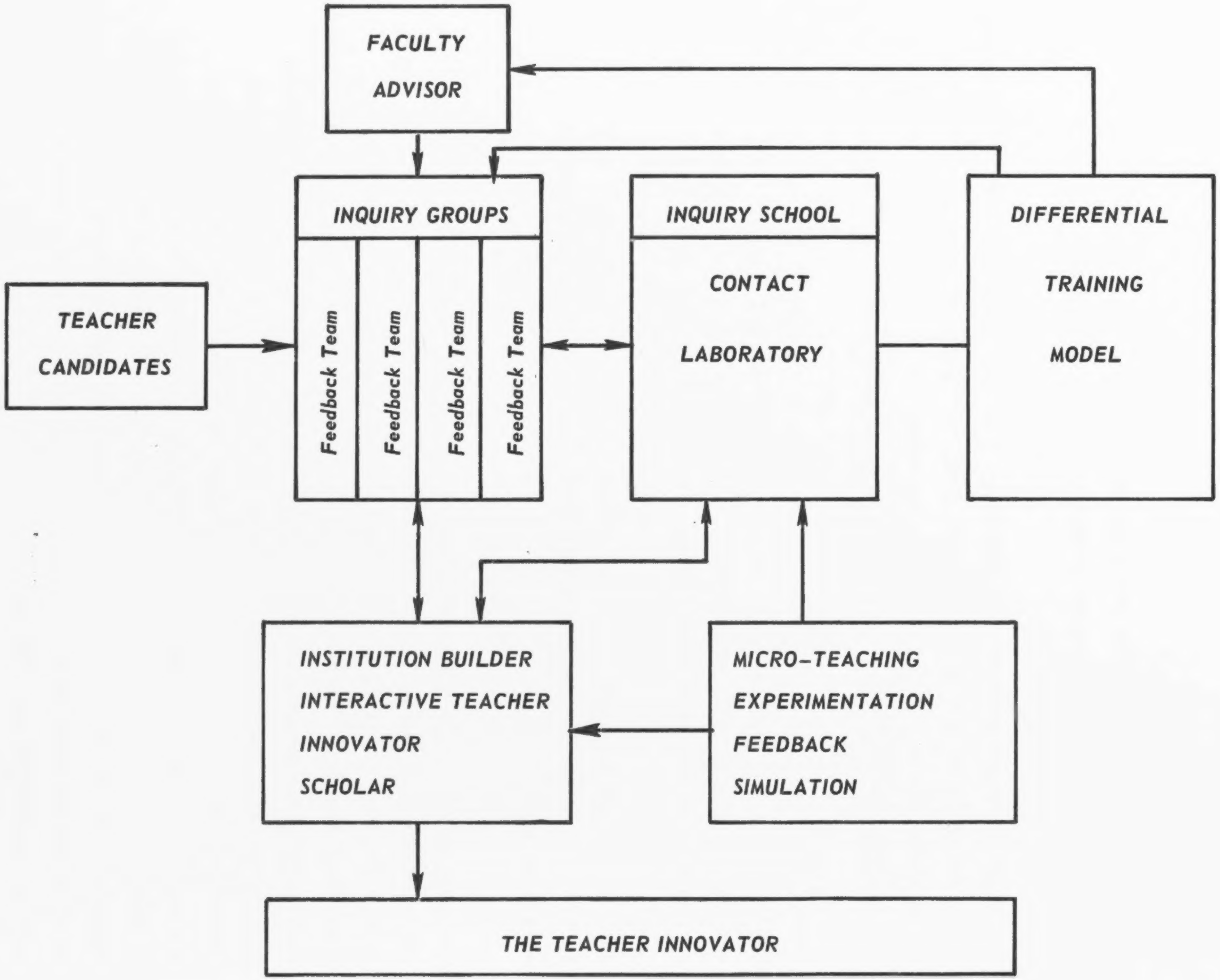

FACULTY
ADVISOR
TEACHER
CANDIDATES
INQUIRY GROUPS
Feedback Team
Feedback Team
Feedback Team
Feedback Team
INQUIRY SCHOOL
CONTACT
LABORATORY
DIFFERENTIAL
TRAINING
MODEL
INSTITUTION BUILDER
INTERACTIVE TEACHER
INNOVATOR
SCHOLAR
MICRO-TEACHING
EXPERIMENTATION
FEEDBACK
SIMULATION
THE TEACHER INNOVATOR

Figure _1_. Teachers College Instructional System

THE FLORIDA STATE UNIVERSITY MODEL FOR THE PREPARATION OF ELEMENTARY SCHOOL TEACHERS

Overview

The Florida State University elementary teacher education model represents the efforts of an interdisciplinary team to design a program of teacher preparation which will meet the expectations of society and the demands of the schools in 1978.

Predictions about society for 1978 include an accelerating trend toward urbanization, an increasing challenge to traditional wisdom, the pervasiveness of multiple mass media, and the dominance of science and technology as forces in our lives. The international character of life will influence social, political, and economic affairs in a striking way, while the factors presently alienating young people will continue to operate. The federal government will undertake a massive effort to alleviate social ills.

This society of 1978 will make increased demands upon schools and colleges to meet two kinds of needs, those relating to the world of work and those relating to responsible citizenship. As education becomes increasingly "society-oriented", the public will use the political system to bring pressures on the schools, and tension between educators and the general public will increase. Emphasis will be placed on the individual and on relevance in learning, especially through the recognition of plural cultures and in the inner city school's ability to relate directly to the total environment. These developments will lead curriculum developers in both elementary and secondary schools to overcome extreme separate-subject-centeredness and move toward a more interdisciplinary design.

Major Themes

These predictions about the society and schools of 1978 imply that only broadly educated persons of high ability will be able to meet the demands of elementary teaching. There are indications on all sides that the teaching profession seeks a measure of autonomy and that it wants to be a party to the wide range of decisions which need to be made about education, schools, and teaching. For society to extend the autonomy which the teacher requests, will require assurances that the teacher can make of himself the wise and well-informed person on which such autonomy depends. To meet this demand, the teacher will need to:

- Master at least one academic content area as well as have a high level of competency in utilizing a large number of teaching strategies.
- Have the ability to work effectively with other professionals and paraprofessional personnel.
- Participate in both a pre-service and in-service training program planned as a continuum.
- Have a view of the elementary school as continuously in transition and have the ability to change and adjust to varying environments.

Instructional Goals

This view of future changes leads to the analysis of the teacher role in terms of four behaviors: planning instruction, selecting content, employing goal-oriented teaching strategies, and evaluating outcomes. In addition, the teacher will function as a competent and responsible professional leader. This description of teaching behaviors provides the basis for a systematic approach to program development.

The view of this model is that the major difficulty with typical programs is their passive treatment of the learner by talking about the learning process but not helping the trainees learn how to teach. Current programs lack flexibility to provide for individual differences. They also fail to include systematic feedback for the modification and improvement of the program.

To overcome these deficiencies, a systems approach for planning programs was initiated based on a logically organized component breakdown of the tasks of teaching. Within this framework each program component is analyzed in three parts: "enabling objectives," "prototype teacher behaviors," and "learning experiences." Each of five components or major objectives is detailed following a format which provides an introductory statement, an abstract of objectives, a detailed sequential listing of enabling objectives, juxtaposed prototypical behavioral outcomes, and codes representing suggested types of training experiences. The behaviors described include:

. Behavior One:	Formulating Objectives
. Behavior Two:	Selecting and Organizing Content
. Behavior Three:	Selecting and Executing Instructional Strategies
. Behavior Four:	Evaluating the Outcomes of Instruction
. Behavior Five:	Assuming Professional Responsibilities

The model envisions the use of a vast menu of learning experiences in five modes: individual, group activities, field observations, simulations, and teaching experiences. The choices include computer interactions, use of audio-visual devices, lectures, producing and observing simulated situations, tutoring, and small group teaching.

Each behavior is explained in terms of its objectives, theoretical considerations, and the goals of the study (or emergent teaching strategies). The behavior is then broken into its component parts. For each part an enabling objective describes the knowledge or behavior which is necessary to perform a prototype teacher behavior. For each behavior one or more experience modes is suggested.

The appendixes include similar analyses of the major knowledge fields (science, music, mathematics, industrial arts, health, physical education, language arts, social studies, and art education). Similar profiles are included for the early awareness-involvement program, the pre-service program, and the delineation of learning strategies.

Overall Program Organization

A basic requirement for admission to the program is evidence of high intellectual ability and achievement. Indeed, the improvement of the training program and the recruitment of increasingly capable students complement each other, and, as the demands on the elementary school increase, successful teaching will require high levels of ability.

Along with intellectual ability and achievement, a strong personal commitment to teaching will be required. Personal interviews will be used to discover those intellectually capable students who are highly motivated toward making teaching a career.

The third criterion of admission will be evidence of physical and mental health. Admissions criteria will be applied by means of commercially available tests of aptitude, achievement, attitude, and value scales, as supported by counceling experiences. A computer-based, individual profile, data system will monitor each student throughout the program.

The program is designed to prepare teachers to work with elementary children, ages 3 to 13, but divided between early childhood (ages 3 to 8) and later childhood (ages 9 to 13). The basic model program is built around a three-phase concept (see Figure 2) designed to provide not only a broad academic competence and a skills base for beginning teaching, but also the final polish of professionalism and teaching competence. The three phases of the program are: underclass, pre-service, and the in-service segment.

Curriculum Design

The underclass phase, or the first two years, concentrates on general education and pre-professional studies designed to enhance commitment to the profession. General education includes the study of the natural sciences, social sciences, history, and the humanities. This program has double significance for elementary teachers because they use their general education for themselves and as raw material for subsequent development in teaching. Approximately two thirds of the underclass phase will be devoted to general education.

The underclass phase also includes a block of pre-professional studies which will account for approximately one-third of the student's time. These studies consist of the behavioral sciences--psychology and sociology cultural anthropology, physiology, and human development--to form a background for understanding the learning process, the meaning of organized education, the modifiability of human behavior, and the nature of teaching.

This phase also includes a group of early awareness-involvement experiences designed to familiarize the student with the nature of elementary school teaching. These experiences provide the student with information about teaching while giving him a chance to examine his desire to teach. Four types of experiences are included: individual

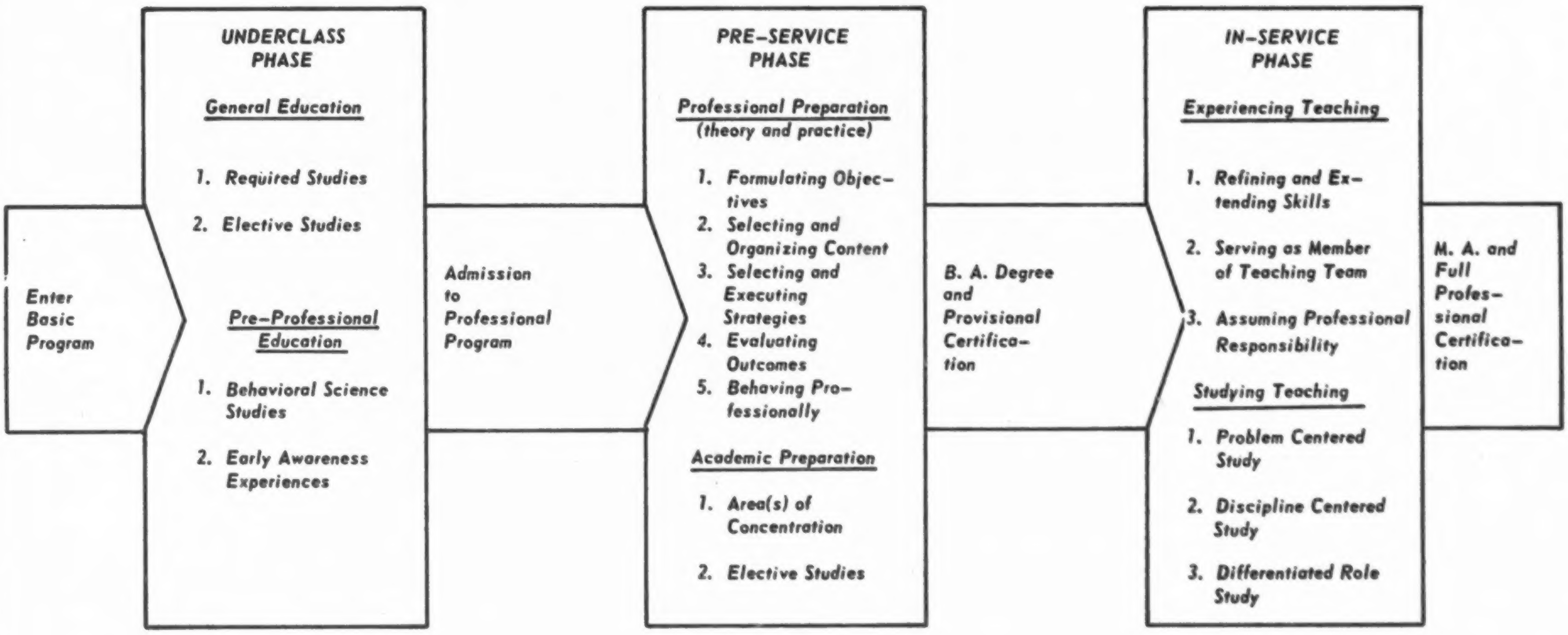

Enter Basic Program
UNDERCLASS PHASE
General Education
1. Required Studies
2. Elective Studies
Pre-Professional Education
1. Behavioral Science Studies
2. Early Awareness Experiences
Admission to Professional Program
PRE-SERVICE PHASE
Professional Preparation (theory and practice)
1. Formulating Objectives
2. Selecting and Organizing Content
3. Selecting and Executing Strategies
4. Evaluating Outcomes
5. Behaving Professionally
Academic Preparation
1. Area(s) of Concentration
2. Elective Studies
B. A. Degree and Provisional Certification
IN-SERVICE PHASE
Experiencing Teaching
1. Refining and Extending Skills
2. Serving as Member of Teaching Team
3. Assuming Professional Responsibility
Studying Teaching
1. Problem Centered Study
2. Discipline Centered Study
3. Differentiated Role Study
M. A. and Full Professional Certification

Figure 2
The Florida State Three-Phase
Plan for Preparing Elementary Teachers

counseling, small continuing seminars, video-tape viewing and discussion sessions, and clinical involvement in simulated teaching situations including direct experience with children.

The pre-service phase, roughly the junior and senior years through the B.A. and provisional certification, includes an academic concentration, pre-service experiences, and electives designed to prepare a student to meet the level of competence required of a beginning teacher.

There are five major features of the pre-service program. Self-pacing will permit the student to move through the program at his own rate. Although some courses remain, the professional training component is comprised of a series of sequenced experiences which the trainee will begin when he feels he is ready. Performance evaluation,rather than standard grading, will test the student's ability to meet specific criteria. Major evaluations of teacher behaviors will be from observation of a simple skill or technique through a range of behaviors to the most complex. Sequenced theory-practice contiguity will be accomplished through the use of observation, simulation, and micro-teaching, to effect behavior revision, for which immediate opportunities will be provided. A series of progressive synthesis experiences will provide the student opportunities to practice application of principles he is learning and to develop new skills as he approaches mastery of a complex set of teaching behaviors. The program thus demands the provision of a sequence of practice-type experiences which progress from application of principles in analysis activities to the reality of classroom teaching responsibilities.

Although the total range of practice experiences is utilized at any point in a trainee's program, a normal progression provides for:

- Systematic analysis of taped or actual teaching episodes.

- Response to simulated instructional situations.
- Teaching in small scale situations including micro-teaching.
- A continuum of experiences from single task teaching with small groups to multiple-task teaching with larger groups.
- Major responsibility for teaching a group of pupils long enough to meet performance criteria for the beginning teacher.

The fifth feature is a computerized management control system which will provide detailed monitoring of trainee performance, progress, and status. It will also permit continuous evaluation, program revision, and flexible scheduling. A program manager will receive computer reports on current and projected trainee activities so that staff, material, and resources can be planned for a given period of time.

The third major phase, the in-service phase, extends through two school years and three summers, culminating in the MA degree and recommendation for full professional licensing. The summer programs will extend the trainee's competence in the educational foundations, teaching behaviors, and area of specialization. The program during the year, designed in conjunction with the local district, will support the trainee in his initial assignments. The in-service phase is considered particularly important because it will provide each new teacher with a built-in plan for professional renewal while linking the school district and the unversity to interact for their mutual support.

Institutional Relationships

Each of the cooperating school systems will be asked to designate one or more elementary units as portal schools. These schools will be the major vehicle between the pre-service and in-service phases of the model program and will be the gateway for entry into the teaching profession. Characteristics of these schools will include a principal and staff who are inclined toward innovation. They will use appropriate segments of the "new" curricula; they will employ some of the new organizational arrangements, including differential staffing and modular schedules; and they will make considerable use of new educational media. These portal schools will mark a smooth program transition for the beginning teacher. In turn, the district will have a ready supply of new, highly trained teachers.

Innovative Features

Those features which the developers of the model envision as being unique include:

- the use of performance criteria in place of formal courses
- a flexible time design to match the individual abilities of each student
- the designation of portal schools for immediate application of theoretical learnings about teaching and for experimenting with innovative methods
- a computerized management control system to monitor individual trainees' progress and to predict the need for staff, space, and other resources
- provision for faculty retraining consistent with the demands of new roles in the model

The retraining of faculty becomes a major problem because many of the roles required in this program are new to professional teacher education.

Three main types of assignments have been identified for faculty in the professional component: administration-student personnel, teaching-counseling and selecting and producing materials. Typically, a faculty member will serve as a teacher-counselor and as either an administrator-student personnel worker or as a selector-producer of materials.

The model program requires an interdisciplinary team for much of its realization. Much of the faculty, therefore, will be drawn from their own administrative units where the interest tends to focus on the development of specialists in their respective fields, and understandably most staff members in these disciplines are not greatly interested in providing service in the form of source offerings. The model, however, offers incentives for research, and this factor could serve to increase faculty interest.

Student Guidance

Student guidance is provided for by the designation of each faculty member as a teacher-counselor. A feature of the Computerized Management Control System is easy accessibility to data on each student's progress for this counseling purpose.

Management and Control

Three major purposes will be served by a Computerized Management Control System (CMCS). First, each student's progress will be monitored, and data about his progress will be made available to the student and to his counseling professor. Second, summary data on the progress of all students will be available to project managers. This information will help predict the need for personnel, space, and other resources. The third use will be to provide for researchers interested in variations related to success in training and teaching.

Two interrelated data systems are planned as a result of an analysis of user needs. The first system is designed to serve the trainee, the professor, and the administrator; it will operate in real-time, via remote terminal access for the first two users, and will operate in batch-mode for the administrator. The second system will operate only in batch-mode and will be entirely oriented toward the needs of the curriculum director.

A real-time management system will utilize the management tool called Program Evaluation and Review Technique (PERT) for the control of a trainee's program. This system will best permit the maximum use of the management system to further the goals of individualized planning and sequenced learning. A PERT network will be constructed for each student and will contain information on the student's background, a sequential list of criterion behaviors, student progress reports, a list of activities available for achieving each event, and the estimated time for achieving each objective. Through a coding system this information will be available to the student and the counseling professor when needed.

Placement and Follow-up

The portal school and the inclusion of the in-service phase as a major feature of the full program facilitate the student's transition into the teaching profession. This phase not only supports the student in his initial years of teaching but provides the university with immediate feedback for revising and updating their program.

GEORGIA EDUCATIONAL MODEL SPECIFICATIONS FOR THE PREPARATION OF ELEMENTARY TEACHERS

Overview

The University of Georgia proposes to abandon traditional courses in favor of a behavioral model for training elementary teachers through individualized procedures. The model is based on the premise that the purpose of education is to change behavior by nurturing human potential toward the fulfillment of commonly endorsed goals. Within this frame of reference the school is expected both to reflect the values of society and to be an instrument for improving society. The program combines instructional procedures with various insights for dealing with the cognitive, affective, and psycho-motor characteristics of the teacher and learner.

Thus, the goals for the elementary school in the future should result from a range of values that will both perpetuate and improve a diverse social system. No basic change in this system is foreseen.

Major Themes and Instructional Goals

The stated goal of the Georgia model is "to produce teachers with the common characteristics of optimum effectiveness." The first step in building the model was a job analysis to define the role of the teacher. It was assumed that a model teacher education program should be based on the teaching act. The approach used in developing the job analysis encompassed a study of the goals of the elementary school which provide the basis for the objectives of the schools. The next step in the study was observation of specific pupil learning behaviors.

Other components which were influential in the study were: the requirements of society, recommendations of professional societies, knowledge of educational technology, observations of the teacher on the job, and knowledge from professi education regarding the teacher's role.

The job description re ing from the analysis showed that the teaching task could be categor into four levels: aide, assistant, teacher and specialist.

An important concern of the program is an attempt to develop a teacher with adequate personality characteristics. This aspect is seen to be as important as intellectual development. With this description in mind, the University of Georgia staff evolved a career development program design.

Overall Program Organization

Requirements were set forth establishing how content of the model program was to be organized and presented. Included were specifications: (a) that the model program should be systematically planned in terms of goals and should contain objectives so stated that wherever possible they may be reduced to behavioral terms, (b) that content should be organized in accord with how it can be most effectively learned, (c) that instruction should be controlled by demonstration of mastery (rather than by a rigid time schedule), (d) that content should be organized in such a manner that practical applications and basic theoretical concepts are introduced concurrently, stressing their interrelationships, (e) that more complex theoretical considerations should be undertaken only after basic practice and theory have been assimilated, and (f) that content should be selected to give appropriate relative emphasis to all objectives, including those related to the subject matter, thought processes, skills, and attitudes regarded as essential for effective performance of the teacher.

Because of the ever-present need for teachers, admission procedures related to multi-entry points and paths are provided in the model. Traditionally, the route to teaching has been directly from high school to college and into teaching. An alternative is proposed, allowing the student to enter teaching directly from high school as an aide. The non-instructional duties of the aide make this a reasonable possibility. In this way the student could attend college on a part-time basis while gaining experience in the classroom. This would also make it possible for the student to determine early in his college career the desirability of continuing in the education profession. From this beginning, the student can advance to teaching assistant, become a certified teacher, and finally move toward becoming a specialist. A third route allows non-education majors to enter as aides or as teaching assistants and then complete their professional training. This path could serve at least two desirable purposes. It would give the student a broader experiential background for whatever profession he finally pursues; it could possibly attract more interest in the teaching field or education-related fields.

The development of selection specifications for candidates for admission was based on an investigation of the teacher personnel pool and the job analysis. These investigations demonstrated the need to:

- Increase the pool of teacher candidates.

- Increase the input of qualified teachers.

- Develop a teacher career field.
- Provide appropriate categories for all entry personnel.
- Increase standards for elementary teachers (as soon as supply satisfies demand).

Although there are several entry points envisioned by the model, the admission procedure for elementary education majors is given in Figure 3 Average scores are expected in such standardized tests as the SCAT for pre-service levels or the GRE for the specialist level. The applicant should be in the upper half of his high school class. The applicant also should show an interest in the teaching profession and satisfactory results from the personality schedule and biographical information blank. Any significant deviation from the norm is cause for an interview by a psychologist.

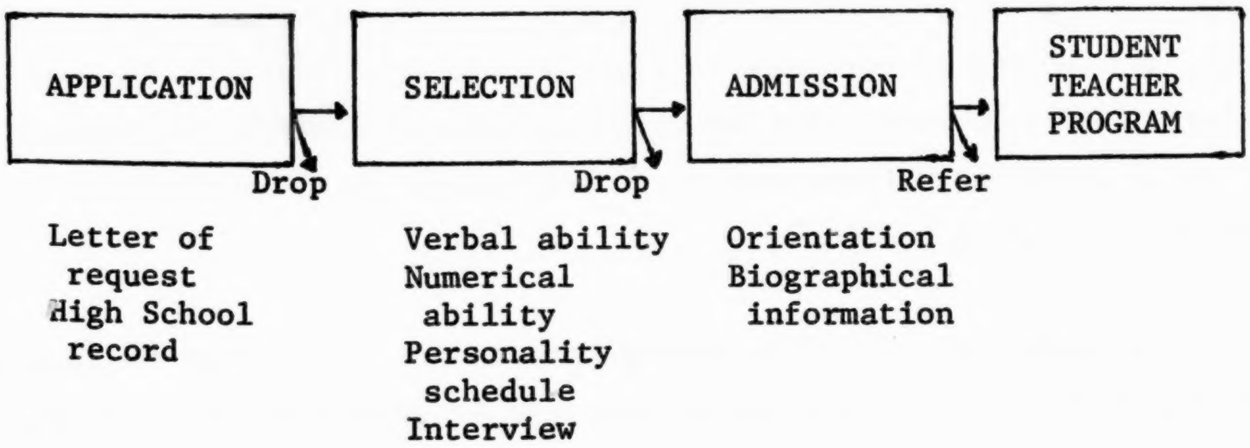

APPLICATION
SELECTION
ADMISSION
STUDENT TEACHER PROGRAM
Drop
Drop
Refer
Letter of request
High School record
Verbal ability
Numerical ability
Personality schedule
Interview
Orientation
Biographical information

Figure 3

The shortage of teachers makes the suggested scores unattainable in certain situations. The average scores are suggested as developing predictors of success but can be modified as needed. Entry scores are not differentiated for the four personnel categories because a career development program should admit only candidates who are judged as capable of reaching the highest plateau.

As a result of the job analysis, performance specifications were developed to describe competencies that a teacher should possess in order to operate at optimum effectiveness in a teaching-learning situation.

Approximately 2,000 specifications for teacher performance were developed in 24 categories. These specifications include both basic general education content as well as professional training. Teacher performance specifications in content areas of general and professional education have been classified according to the level of mastery necessary for optimum performance in three positions: assistant teacher, teacher, and specialist.

Some of the general education categories are: social studies, mathematics, science, composition, literature, etc. An example of specifications taken from mathematics:

3.14.02 Historical development of system of numeration
3.14.06 Basic ideas of number theory

The level of knowledge and understanding in each specification is differentiated for each position, i.e., the specialist's need would be different from the teacher's, and the teacher's, in turn, would be different from the assistant's.

Specifications for proficiency levels in professional education areas are classified in the same way as those for general areas. Professional categories include: educational tests and measurement, pedagogy, social foundations of education, guidance and counseling, media, etc. Some sample specifications from social foundations of education are:

3.24.02 Various cultures and the ways in which they influence individuals to develop particular types of behavioral characteristics.

3.24.06 Methods to structure situations in which pupils can assess the ways in which social values and norms operate to control an individual's behavior.

3.24.07 Appropriateness and consequences of various types of social and/or educational changes.

Statements of desired personality traits are presented without classification levels with the assumption that each student will strive toward maximum attainment. Some examples of such personality characteristics are:

3.24.01.04 Confront the type of anxieties and types of fears one lives with in daily life, in order to achieve more effective behavior.

3.25.01.07 Study and examine the effects of the behavior of others upon oneself when choosing one's own behavior.

Curriculum Design

The proficiency module (PM) was created as the necessary vehicle for a system based on these and other criteria that would reflect the ideals it sought to fulfill. The content of a PM is related teacher performance behaviors including definitions, facts, concepts, thought processes, motor skills, and attitudes. The core of the PM is a series of learning tasks prepared by specialists. The tasks are designed and arranged in the most effective known means of guiding students toward the acquisition of the performance behaviors. They provide multiple sequences for development so that they will be adaptable to individual differences among students.

Such a module is intended to be a guide to direct individual student learning behavior. It is a means of organizing various areas of content for instruction to assure that the student will acquire the content of the module by carrying out the instructions contained in it.

PMs avoid duplication of content and provide for individualized instruction by allowing the student to proceed at a rate that is both comfortable and challenging.

Before each new PM is begun, a diagnostic evaluation pretest is given to determine the student's initial status in relation to the content to be learned. His prescribed PM activities involve only those behaviors he has not already acquired. A posttest is given after completion of the PM to determine the student's new status in relation to the learning tasks he has covered. If by then he has acquired all of the new behaviors, he moves on to another PM at a higher level. If the student is unsuccesful or if serious uncorrectable deficiencies are detected, provisions are made for clinical assistance or for transfer into other paths or programs. A student's progress through a PM is shown in Figure 4 .

The career development field initiated in response to the findings of the job analysis is shown in Figure 5. This model was designed to satisfy the requirements of increased quantity, quality, and utilization of teacher personnel in each of the four categories; teaching aide, teaching assistant, teacher and specialist.

According to this classification, the aide will perform non-instructional tasks under direction of an experienced teacher and will be primarily concerned with gaining experience in the school setting.

The second level is that of the teaching assistant who will perform both instructional and non-instructional duties, thus assuming a more complex role. The teaching assistant will be directed by the teacher, with responsibility for initiating and executing certain tasks. These tasks can be performed by an individual with about half the degree and certification requirements of a fully trained teacher.

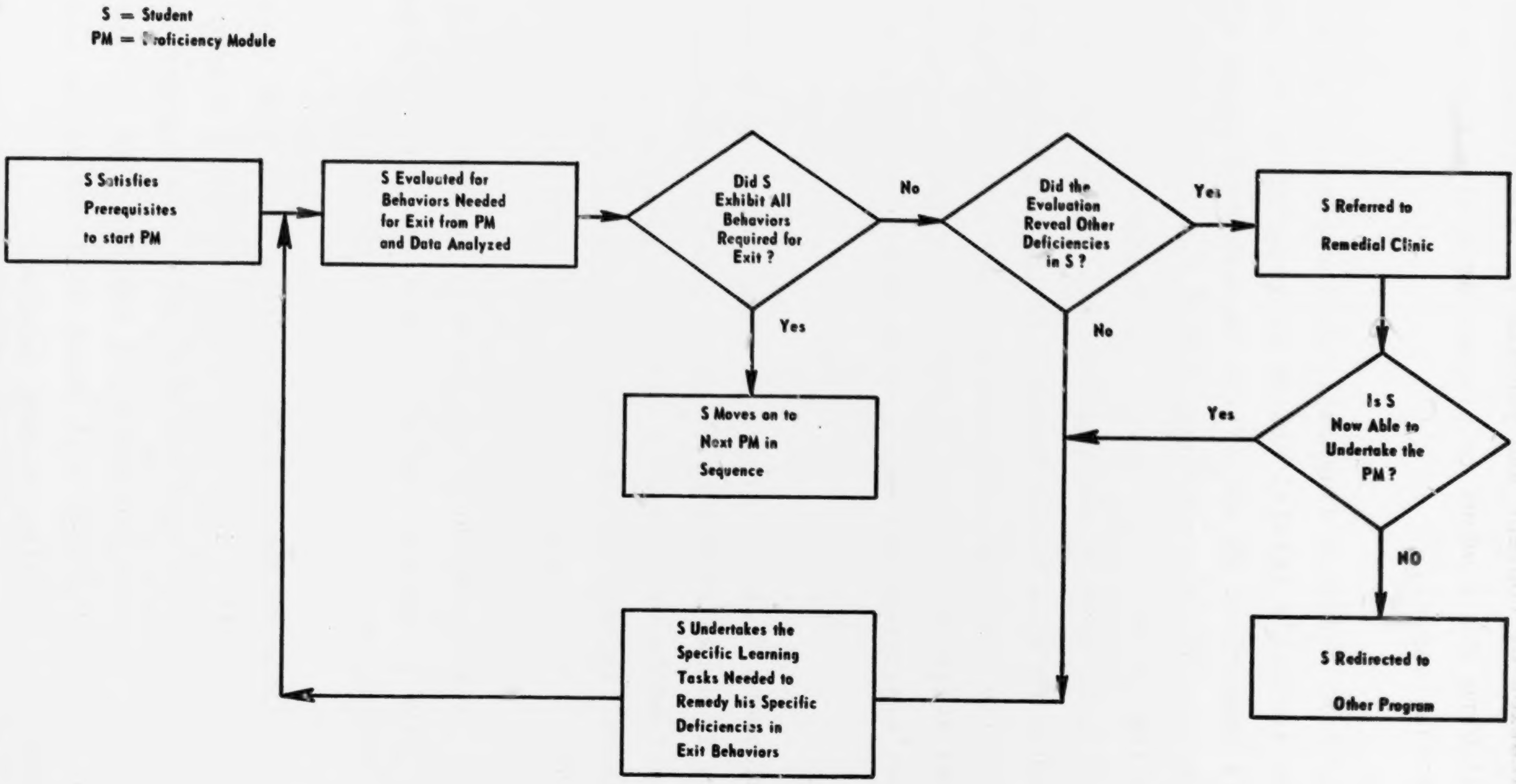

S = Student
PM = Proficiency Module
S Satisfies Prerequisites to start PM
S Evaluated for Behaviors Needed for Exit from PM and Data Analyzed
Did S Exhibit All Behaviors Required for Exit ?
No
Yes
S Moves on to Next PM in Sequence
Did the Evaluation Reveal Other Deficiencies in S ?
Yes
No
S Referred to Remedial Clinic
Is S Now Able to Undertake the PM ?
Yes
NO
S Redirected to Other Program
S Undertakes the Specific Learning Tasks Needed to Remedy his Specific Deficiencies in Exit Behaviors

Figure 4. Flow Chart of Procedures for Use of a PM

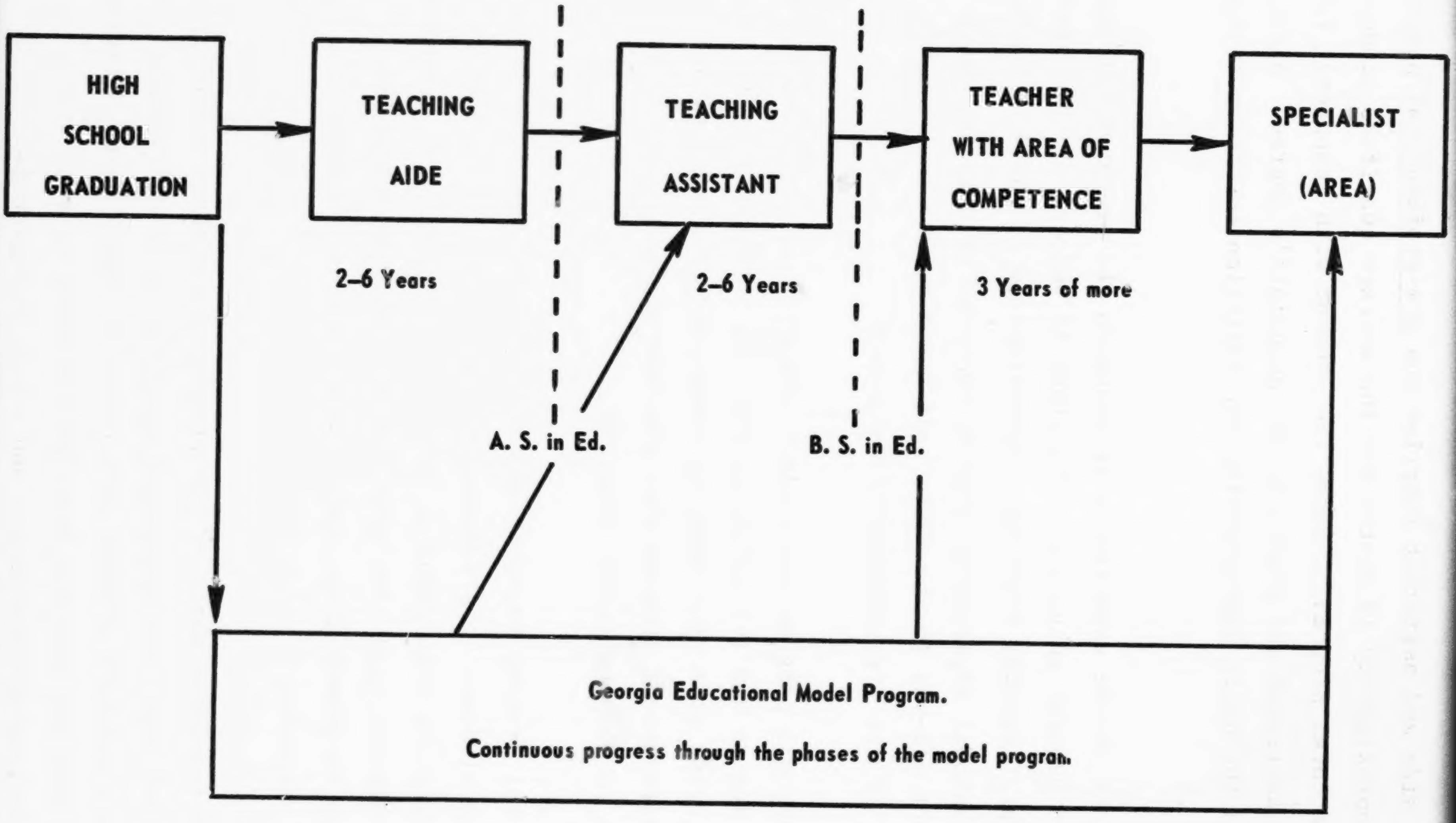

HIGH SCHOOL GRADUATION
TEACHING AIDE
TEACHING ASSISTANT
TEACHER WITH AREA OF COMPETENCE
SPECIALIST (AREA)
2–6 Years
2–6 Years
3 Years of more
A. S. in Ed.
B. S. in Ed.
Georgia Educational Model Program.
Continuous progress through the phases of the model program.

Figure 5. Paths in the Teacher Career Field

The levels of aide and assistant comprise the pre-professional program which should take approximately 18 months for the average qualified student. This segment of the total program prepares the student with competency for service as a teaching assistant and gives him the associate's degree. Also, he will have fulfilled the basic prerequisites for admission to the professional program.

About 90 percent of the experiences provided in the pre-professional program are in general education. The other 10 percent of the experiences are in basic professional training. Approximately 12 weeks of on-the job paraprofessional experiences will be required of the student, 6 weeks occurring about mid-way in the first half and 6 weeks about mid-way in the last half of the pre-professional sequence.

In the professional program the student completes the requirements for a bachelor's degree and for certification. He performs largely instructional tasks, with some time spent in essential non-instructional activities. The professional program also provides the student with prerequisites for admission to the specialist program.

The professional program requires approximately 22 months for completion by the average student. Approximately 25 percent of his effort is spent on general education requirements, 30 percent on an area of competency in which the teacher will have more knowledge and understanding and skill than in others. The remaining 45 percent is given to professional education.

During the professional phase of the program the average student has three on-the-job practical laboratory experiences of approximately six weeks each in elementary schools with different age groups. Placement will be such that the students have opportunities to work with children of various socio-economic and ethnic backgrounds.

An internship of approximately ten weeks is required near the end of the professional program in an elementary school setting with children of an age range which meets requirements of certification for which the student is working. Attention is given to provide the student with opportunities to use the knowledge, understandings, and skills acquired in his area of competency.

The specialist represents the highest level of competence. The specialist engages in activities with children, with school personnel, and with people apart from these groups. The activities are instructional as well as non-instructional. However, the specialist has no significant non-instructional responsibilities with children. Rather, competence in working with children and in providing leadership and service to other school personnel characterize his duties.

The specialist program provides the student with the specialist's degree in one of fifteen areas. They are:

Language Arts
Social Science
Natural Science
Mathematics
Health Education
Art
Music
Foreign Languages
Human Development and Learning
Professional Development
Instructional Media
Pupil Personnel
Curriculum and Program Planning
School-Community Relations

Approximately 50 percent of emphasis is to be devoted to the area of specialization, 40 percent to common experiences required for all specialists, and 10 percent to local conditions or exploratory experiences.

Sample activities from the job description are shown in Figure 6.

Sample Activities

Aide

1. Collects money; keeps records.
2. Assists in playground activities.
3. Operates audio-visual equipment.
4. Distributes materials.

Teaching Assistant

1. Reads and tells stories to pupils.
2. Explains school rules to pupils.
3. Locates reference materials for teachers.
4. Makes arrangements for field trips.

Certified Teacher

1. Analyzes pupil behavior to determine levels of mastery.
2. Listens to pupils talk about themselves.
3. Organizes groups for reading instruction.
4. Confers with parents.

Specialist

1. Uses new and innovative instructional methods.
2. Prepares demonstration lessons.
3. Speaks to lay groups.
4. Assists individuals with instructional problems.

Figure 6

Institutional Relationships

Specifications for the model program require that it involve numerous local and state agencies for effective development, implementation, and sustained operation. City and county elementary school districts will cooperate in the training of elementary school teachers by providing exchange personnel such as coordinators, supervisors, principals, and classroom teachers to work with the model program on a shared basis. They would serve as instructors or program development specialists (visiting professors), as they concurrently assume part-time roles for their specialties in their local school system. Also, these school systems would provide materials, laboratory settings, opportunities for paraprofessional employment of the students as aides or assistant teachers, and recommendation and/or sponsorship of certain students for special training. In addition, they would open the doors of their curriculum libraries and elementary school classrooms for study, reference materials, elementary school learning materials, and for such activities as observation, paraprofessional participation, supervised teaching, field studies, and demonstrations.

As regards state organization involvement, commitments would be made by the Regents of the University System of the State of Georgia for awarding degrees and by the State Department of Education for awarding teaching certificates. Also, reciprocal agreements are to be made to provide cooperative working relationships with the junior colleges of the state and with other interested colleges and universities. These agreements would parallel the preprofessional phase of the program in those institutions where lower division students would enter the model sequence in what has traditionally been called the "junior year."

It is also specified that agreements be made with research and development centers and regional laboratories which are concerned with early childhood education, education of the culturally disadvantaged, education of non-English-speaking children, and elementary education, and would share their research findings, programs, and facilities to the mutual advantage of these organizations and the model program operation.

Innovative Features

Many of the features of the model program which make it exemplary have already been noted. These include among others the individualized or clinical nature of the instruction, the use of performance behaviors as the core of the design, the career sequence, proficiency modules, long-term follow-up program evaluation providing for continuous renewal, broad involvement of local and state educational organizations, and an administrative organization designed to serve the functions of the instructional program. However, there are certain features which are not directly evident from the specifications. These include: year-round education, staggered registration, mastery criterion, and a teach-as-taught effect.

Year-round education: The model program encourages institutions of higher learning to be operative 12 months a year. With this program there is no reason for semesters, quarters, summer vacations, or spring recesses. Such a plan provides for more continuous use of the student's time. It could also provide for increased utilization of the professorial staff. Similarly, physical facilities and materials which are partially used at times, and overloaded at others, might be provided more uniform attention with considerable savings.

Year-round education with individualized instruction might also provide in other ways for the conservation of human resources. For example, the capable student with limited financial assistance might be able to keep his part-time job and continue learning activities through what are now lengthy vacation periods, and the student who loses 6 weeks through illness could resume his responsibilities without the serious losses which are evident under the conventional semester or quarter system.

The model program is designed to encourage the practice of staggered registration. That is, insofar as enrollment in the model elementary teacher preparation program is concerned, registration of beginning students could take place whenever a suitable number (for example, 25 to 30) were ready and facilities were available. This might be monthly. Thereafter, each student would enroll in the next PM block as soon as he had completed the prerequisites.

Mastery criterion: At the core of the model program are behaviors which are categorized and sequenced. It is the acquisition of these behaviors that determines the student's success. This is in contrast to the conventional program in which success is often determined on the extent to which a given amount of knowledge is acquired in a given amount of time.

In the model program the student must acquire a defined level of mastery of any particular behavior before he is regarded as having the prerequisites to move on to the next. Thus, the model program encourages the elimination of letter grades, grade point averages, and other symbols of achievement which are based primarily on the extent of achievement within a given time period.

Teach-as-taught effects: In the past many teacher education programs have been subject to the criticism that their instructors have tacitly expressed the "teach as I say, not as I do" principle. In many institutions of higher learning, teachers in in-service, as well as students in pre-service preparation, have experienced a lock-step instruction, void of provision for individual differences and based upon time criteria with rewards in the form of symbols, while at the same time they are taught to provide for individual differences, develop intrinsic motivation, and care for personality development of the children under their supervision. Despite the fact that many of these elementary school teachers endorsed the principles of sound educational procedures presented to them, relatively few were able to invent and devise sufficient techniques to implement the beliefs they endorsed, on the basis of their experiences. Thus, many eventually retreated to teaching as they were taught.

Since the model is designed to incorporate the principles of instruction that are common to an exemplary elementary school program of instruction, it is anticipated that as these teachers take their places in educational practice upon completion of the model program, they will teach as they were taught. They will have learned firsthand the techniques to implement their beliefs.

Student Guidance

The student is assigned an advisor at the beginning of each segment of the program -- pre-professional, professional, and specialist. The advisor is a professor in elementary education whose specialty is related to the student's selected area of competency.

Advisors and students meet weekly in groups to discuss problems of general concern and current professional problems which are not likely to be covered in PMs. Advisors also provide office hours to be given to individual student consultations.

The micro-teaching technique is used in intern teaching. In this procedure, the student and supervisor play back a video-tape recording immediately after the student's presentation. In response, the supervisor and the student note the opportunities for significant learning which the student did and did not treat adequately.

Included in the development program are five kinds of laboratory facilities: (a) General Resources Laboratories which include facilities used by all students of universities, colleges, and schools such as central libraries and computer instruction centers, (b) Instructional Unit Central Resources Laboratories which provide all learning materials and equipments essential for the undertaking of PMs within particular areas which are not readily available in General Laboratories, (c) Instructional Unit Field Laboratories which provide field facilities as needed, (d) Clinics in which remedial services are provided when required, and (e) Instructional Unit Interaction Laboratories which arrange for such activities as special lectures, seminars, workshops, and recitals.

Management and Control

A reorganization of the College of Education will be necessary for operation of the model program. The model includes specifications for administrative organization as the basis for such a reorganization.

Persons who have achieved professorial status for their high level of academic competency should not dissipate these qualities in managerial tasks. Qualified managers and counselors will be employed to facilitate the work of the professors.

The Dean of the College of Education is the head administrator working with a committee of executives drawn from all colleges responsible for the education of pre-service and in-service elementary teachers plus superintendents of school districts, and representatives of the state department who are concerned with education. The Director of Teacher Education is the chief administrator for staffing and implementing the program. Under his direction are three directors of professional status and one manager. They are: Director of Program Evaluation, Director of Project Evaluation, Director of Instructional Units, and Manager of Student Program Advisement Services.

The Director of Program Evaluation is concerned with the entire evaluation system in the program including the follow-up. The Director of Project Evaluation is an outside observer with no operational responsibilities or involvement in the program. He and a panel of outside consultants will evaluate the various components of the program.

The Director of Instructional Units is directly responsible for curriculum and, with the help of his staff, supervises the separate instructional units. The Manager of Student Advisement supervises the work of three coordinates (managers), one for each of the sub-programs: pre-professional, professional, and specialist. These managers facilitate the work of the advisors and instructors.

Each of the various instructional units is a separate organization having an advisory board, director, manager of instructional unit, and three associate managers in charge of various services such as clinics, instructional unit laboratories, laboratory experiences, and group interaction learning experiences. The instructors of the instructional units report directly to the Director of the Instructional Unit, but their work is facilitated by the managers.

Placement and Follow-up

The model does not make any provisions for placement other than those implied in the previous section on Institutional Relationships.

A systematic evaluation of the program consists of identifying a frame of reference for the school, establishing objectives to be achieved, defining expected behaviors, developing measures for those behaviors, and finally appraising student achievement. Evaluation provides data for the systematic revision and improvement of the model. Operations analysis includes the constant program evaluation feedback and adjustment of the model.

The total in-service program is divided into 16 blocks of PMs arranged in sequence. After all PMs have been administered for a given block of the program, the progress of the student is reviewed by an advisor. The progress is appraised based on the results of mastery and performance tests. The advisor will then advance the student to the next block, or, if the progress is unsatisfactory, the student is retained for further preparation or is referred for special advisement. Progress reviews and possible routes are depicted in Figure 7. The final block represents a period of follow-up evaluation designed not only to determine the student's success as a teacher, but also to evaluate the program itself. In this way continuous improvement of the model program is effected.

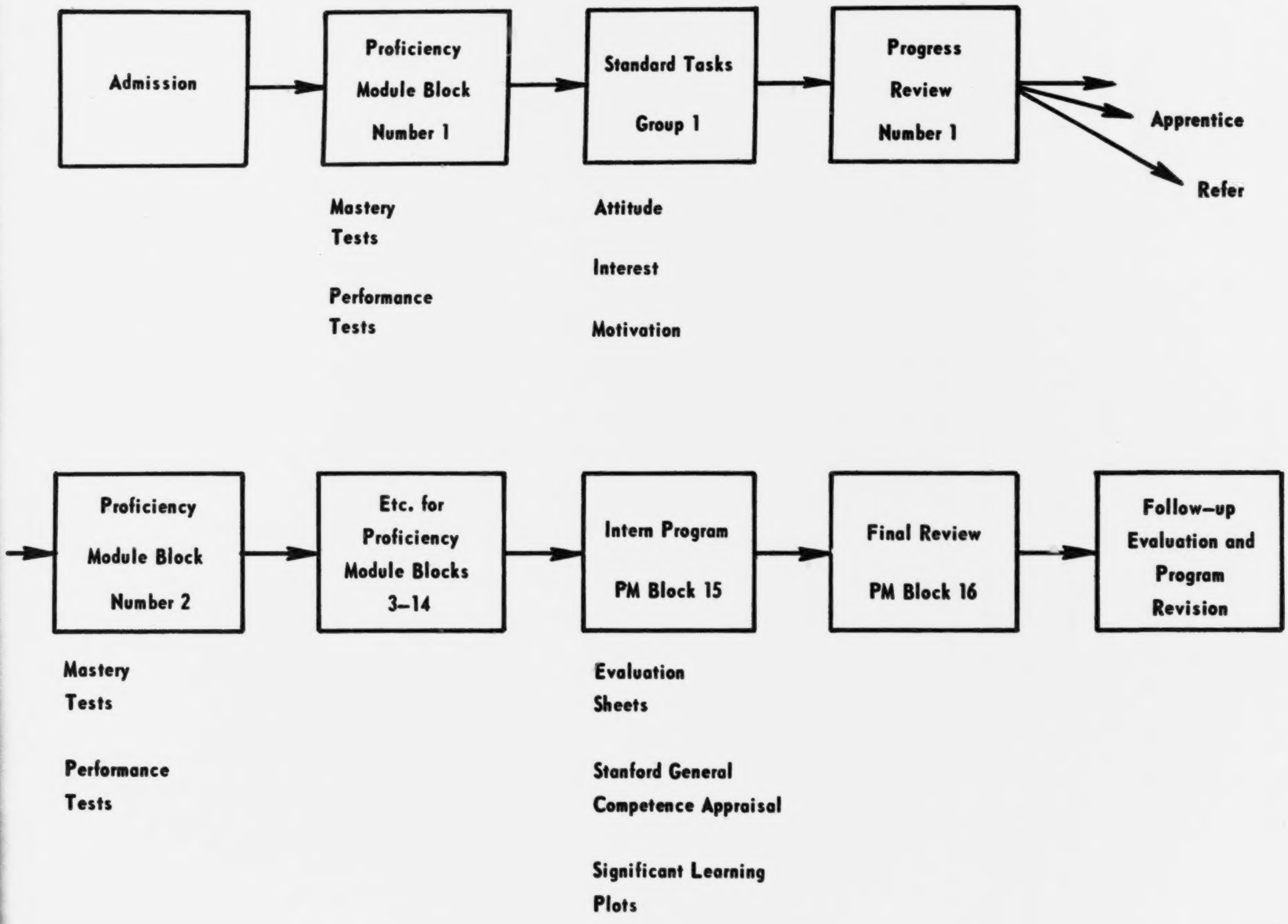

Admission
Proficiency Module Block Number 1
Standard Tasks Group 1
Progress Review Number 1
Apprentice
Refer
Mastery Tests
Performance Tests
Attitude
Interest
Motivation
Proficiency Module Block Number 2
Etc. for Proficiency Module Blocks 3–14
Intern Program PM Block 15
Final Review PM Block 16
Follow–up Evaluation and Program Revision
Mastery Tests
Performance Tests
Evaluation Sheets
Stanford General Competence Appraisal
Significant Learning Plots

Figure 7. Progress Review

THE UNIVERSITY OF MASSACHUSETTS
MODEL ELEMENTARY TEACHER EDUCATION PROGRAM

Overview

The University of Massachusetts model is presented as a response to the need to prepare future teachers for change rather than for stability. It contains a strong emphasis on the human relations aspects of teaching. Other important emphases center around performance criteria, multiple instructional routes, differentiated staffing patterns, and continual in-service training programs.

The model accepts the fact of wide differences among teachers and proposes both staffing patterns and teacher training programs to respond to these differences. As diverse criteria are applied to the analysis of teaching, staff assignments can be based on varying levels and kinds of competence. Teacher education programs can then be designed to achieve differing staff requirements.

Change and differential staffing imply the active participation of teachers in determining the school's structure. Senior professionals will guide the novice. In-service training programs will be essential school activities. Graduation from a teacher training school will be seen as only a part of the teacher's education.

Students in the program are directed toward achieving competence at different levels and in different areas. Program completion is determined by meeting specified performance criteria, regardless of length of time enrolled.

To insure that instruction will be responsive to individual strengths and weaknesses, there will be continuous assessment of each student's needs. In addition, multiple instructional alternatives will be developed, so that there will always be more than one possible path to follow toward any specific teaching competence.

Instructional Goals

The overall goal of this program is to prepare teachers for changing roles in the elementary school. Goals for individual teacher trainees will be identified as sets of behavioral objectives, differing from student to student. To achieve these goals, a curriculum based on level of achievement (performance criteria), rather than on fixed times and courses of study, will be developed.

Carrying out a program based on performance criteria requires specifying goals in terms of behaviors to be demonstrated. Performance criteria state the behavior expected of the teacher, the conditions under which the behavior will take place, and how the behavior will be evaluated. In addition, at least two instructional alternatives are provided for each performance criterion.

The program's various goals, as expressed in differing performance criteria, result in a hierarchy of teaching competencies and also in distinguishing between generalist and specialist teachers. A hierarchy of three levels of teaching competencies is implied by the existence of three areas of performance criteria related to teaching: content knowledge, behavioral skills, and human relations skills. The first of the three levels is subject matter competency, which is produced by mastery of content knowledge alone. The next level is presentation competency, which requires mastery of behavioral skills in addition to content knowledge. The final level is professional decision-making competency, which requires mastery of human relation skills.

Program goals and performance criteria also differ according to whether a student wishes to specialize in some particular area, rather than being a generalist with some competency in all areas. For differentiated staffing, specialties are possible both in various content areas (such as science or foreign languages) and in service areas (such as evaluation or media techniques). If a student elects to specialize in science, for example, he would be required to meet certain minimal criteria in the human relations and behavioral areas, a high level of mastery in the area of science, and defined minimal criteria in other areas. The judgment as to whether every teacher should be required to meet minimal criteria in every area should be left to the individual institutions planning to adopt the Massachusetts model. Judgments as to where to set minimal performance criteria should also be made by the adopting institutions. After the program has been in operation, data will be available for determining whether the minimal levels are too high or too low, and they can be changed as needed. The particular balance of specialties and of skill levels in a differentiated staff is also a matter deliberately left unspecified by the Massachusetts model, to allow flexibility in varying school situations.

Overall Program Organization

The University of Massachusetts model program is organized both from an academic and from a systems point of view. Both program organizations are somewhat tentative, since they are put forward as first proposals which will require adaptation to new situations, as well as revision based on accumulating experience.

The academic portion of this model consists of a number of areas of competence or behavioral objectives for which performance criteria have been written. These are considered to be competencies which a differentiated staff in an elementary school might possess. The areas in which students are to be trained are referred to as:

Cornerstone Areas. These emphasize the aspects of human relations and behavioral skills which are indispensable for effective teaching.

Content Areas. Aesthetics, language arts, social studies, science, mathematics, foreign languages, and pre-school education.

Service Areas. Evaluation, media, and supervision.

(These areas are presented in more detail in the section below on Curriculum Design.)

The model is also analyzed from a systems point of view, which groups required functions into several subsystems. The initial list of subsystems proposed includes the following (which are presented in more detail in the section below on Management and Control).

- The control subsystem which maintains day-to-day operation and insures a stable state of the overall system.

- The administrative subsystem which is concerned with program materials and personnel.

- The information subsystem which collects, stores, and processes all information required by the program.

- The placement subsystem which matches trainees with employment opportunities.

- The educator subsystem which generates and delivers the educational experiences needed for the training of student trainees.

- The analysis subsystem which is responsible for reviewing and improving overall program operation.

Curriculum Design

More than half of the Massachusetts model is devoted to presenting ideas and procedures related to specific areas of teacher preparation. The first two of these (Human Relations and Behavioral Skills) are "cornerstones" in the sense of being fundamental to all the rest.

- Human Relations. Specific human relations performance criteria to be met are selected by the student himself in consultation with an advisor and evaluation specialists on a human relations training team. In addition, the program specifies certain minimum and overall performance objectives. Performance criteria include both Intrapersonal System Skills (awareness of self as self, and awareness of self in relation to self and others) and Interpersonal System Skills (two person interactions, small group interactions, classroom interactions, organizational interactions, and specific issues such as sexual awareness and racial relations).

- Behavioral Skills. Skills to be mastered in the behavioral area are organized into five groups -- skills of response, of questioning, of increasing student participation, of creating student involvement, and of presentation. Performance criteria and instructional materials (including model films and student manuals) have been developed. New skills and materials will be added from time to time.

- Aesthetics. The aesthetics study program will attempt to teach three skills related to the non-verbal arts such as painting, sculpture, music, and dance. The first skill involves the ability to free oneself from perceiving things within the limits of verbal description and to develop skills which increase the variety and complexity of sensory intake. The second is the ability to form relations among these sensory experiences and to discover sequences and systems of sensory relationships. The third skill is the development and intensification of the aesthetic experience.

- Language Arts. Communication is the prime focus in the reading and language arts area. The teacher, to be able to improve pupils' ability to communicate, must have knowledge of the processes of communication, proficiency in language and communication content areas, ability to assess the child's level of development and to diagnose his skill needs, and ability to select an appropriate approach to teaching.

- Social Studies. The student should have a scientific background to help in understanding the facets of society. Of prime concern is the sensitivity of the teacher to social phenomena within the classroom and his ability to convert unique social situations into meaningful "social studies." The student should acquire an ability to use the basic tools and skills of the social scientist, an ability to organize and analyze knowledge about society, an understanding of value orientations which affect societies throughout the world, and an ability to make social studies a meaningful part of a pupil's developing awareness.

- Science. There are three major areas of concern within the teaching of science. The first emphasizes scientific knowledge and the general methods of science. The second involves the values and attitudes which one brings to and takes from the study of science. The third includes more detailed skills important to science, such as measuring, manipulating materials, preparing visual presentations, and furnishing emergency first-aid. Two science skill levels are designated -- one for generalist teachers and the other for science specialists.

- Mathematics. The program in mathematics is meant to enable the teacher to understand the language, concepts, and structure of mathematics as necessary for effectively handling the existing elementary school curriculum and for coping with changes as the curriculum evolves. He must develop pedagogical techniques and practical applications from which to generate interesting and relevant experience for pupils. He must develop competence, confidence, and creativity in mathematics education.

- Foreign Languages. The student who is to be a specialist in foreign languages must understand and speak fluently a language of his choosing. He must also acquire presentation competency and, along with this, a professional decision-making competency to guide his teaching strategy. Specific performance criteria are established, as well as alternative training procedures.

- Pre-School Education. Pre-school is considered to be the beginning of formal education, rather than a preparation for education. The pre-school teacher must learn to convey knowledge to the child by way of appropriate concepts to develop the child's personal-social awareness, and to recognize the needs of children from a variety of subcultures. A complete knowledge of child development in the physiological, psychological, sociological, and perceptual areas is paramount.

- Evaluation Skills. The skills and activities included in the evaluation area of this model are intended to differ from and to go beyond what has been customary to date. A skill hierarchy is presented. Differentiation of evaluation skills is organized along both horizontal and vertical dimensions. The vertical dimension would range along a continuum from the novice evaluator (who might be a classroom teacher or administrator desiring only knowledge of the language and fundamental principles of evaluation); to the evaluation technician (who could be located in a school setting to consult with teachers in evaluating classroom practice and in test design, to collect and organize data for large-scale or district-wide evaluations, and to carry out problem-solving evaluations on a small scale basis); and finally to the evaluation specialist (who is placed at an administrative level to add professional competence to district-wide evaluations, to direct and lead the professional growth and work of the lower echelon evaluation personnel, to pursue the further development of evaluation methodology, and to make decisions concerning quality-control of education within the district).

Similarly, the horizontal component would consist of a continuum representing different evaluation functions. It would range from evaluations designed to ascertain effects of a single program according to a set of standards, to evaluations designed to compare the relative effects of different programs or different schools.

- Media. In addition to providing an introduction to media for the generalist, this area has a range of instruction levels increasing to and including the level of the media specialist. The media specialist must master media as a teacher, a curriculum advisor, a technician, and a media purchaser and cataloger.

- Supervision. A supervisor in an educational setting must be more than a successful teacher. He needs to be competent in counseling techniques and in using various strategies to bring about desired behavior changes. He must also understand different styles and methods of teaching. All students are required to meet criteria in the area of supervision. Supervisory techniques are classified into observation methods, feedback techniques, counseling techniques, knowledge of paradigms of teaching, supervisory strategies, and evaluation skills.

- Urban Education. A teacher training program for urban education is proposed. It will prepare prospective teachers for inner city schools which contain culturally diverse students, and will develop behaviors that can be evaluated by specific performance criteria. The program will focus on two areas. First, it will develop feeling-behaving knowledge about culturally different children. Second, students will receive practical experience within the community and will determine how those experiences relate to the children's learning.

Institutional Relationships

The Massachusetts model teacher training program depends to a great extent upon cooperation and interaction between a school of education and other schools in the university. However, a difficulty arises because most colleges and universities are on a semester or quarter system and this model uses a performance criterion system. Problems with schedules, credits, and degree requirements will be unavoidable.

There are three possible ways in which a teacher training program based on performance criteria could interact with the rest of a university in order to solve these problems. First, the entire university program might be based on performance criteria. Second, separate sets of regulations could be established for the school of education and for the rest of the university. Third, steps might be taken to accommodate the divergence by opening up areas of cooperation, compromise, and greater flexibility. The model favors the third alternative.

In-service training is another area in which the model program is related to other institutions. The school of education must establish cooperative arrangements with a cluster of elementary schools in order to place its graduates successfully and aid elementary schools to foster continued in-service training.

Innovative Features

Learning Experiences. With the help of a faculty counselor, the teacher trainee chooses his own set and sequence of learning experiences regardless of any consideration of time-based credit units. The experiences vary according to the student's individual choice of specialty and level of competence. They also vary according to choice of instructional path since the model provides at least two alternative paths to any selected educational objective.

Career Ladders. This model envisages the development and use of a differentiated teaching staff. This is in terms of levels of responsibility based on a hierarchy of performance criteria for each of the teaching roles. Illustrative steps of the ladder might be: Potential Teacher, Helping Teacher, Teacher Intern, Associate Teacher, Staff Teacher, Senior Teacher, Master Teacher.

In addition to the foregoing differentiation of levels, there is differentiation of specialization. A teacher may specialize in one or more of the content areas such as mathematics, science, or social studies; or he may specialize in a service area such as media, evaluation, supervision, or systems and technology.

Systems Approach. In the design and development of this model, a systems analytic approach has been followed. Attention has been given to the interaction and articulation of subsystems including a control subsystem, an education subsystem, an administrator subsystem, an information subsystem, a placement subsystem, and an analysis subsystem. This approach is related to the model's concern with adopting as many widely differing instructional strategies as possible, in order to investigate the efficacy of each in actual practice.

Student Guidance

The model assumes that individual students will differ from each other in their comparative strengths and weaknesses both at the beginning of the program and on a continuing basis as training is provided. Therefore continuous diagnosis of the needs of each student and constant evaluation of the program components designed to meet those needs are important.

Guidance is offered to the student by a faculty advisor who refers to aptitude assessment data and other information. The student and his advisor select educational goals and appropriate performance criteria. Strategies for meeting these performance criteria are determined. The attributes and characteristics of the incoming student play an important role in this process of choosing instructional alternatives for achieving each performance criterion. The student is advised a number of times as he changes and re-evaluates his educational goals.

Management and Control

Management of the Massachusetts Model Teacher Education Program is designed to be carried out through a number of program subsystems, distinguished as follows:

Control Subsystem. This subsystem performs several functions which are involved in maintaining the day-to-day operation of the Model Elementary Teacher Education Program. From a systems point of view it is the process controller who is responsible for insuring that the system remains in a stable state and operates in an optimum manner. It continually analyzes collected data and uses the results of analysis for decision-making. The subsystem provides immediate feedback for system control. Principal specific functions include:

- Aptitude Assessment. As individual students enter the program, aptitude information is gathered. "Aptitude" is very broadly defined and includes personality factors, intellectual ability, socio-economic background, prior knowledge of subject matter and teaching, and other relatively stable features. Initial data on individual students plus information on each student's progress will be used to determine which sequences of instructional alternatives are most effective.

- Guidance. With the assistance of available aptitude assessment data, educational goals are established by Students in consultation with their advisors. Then appropriate strategies for meeting required performance criteria are determined. Students may be advised a number of times as educational goals are re-evaluated and changed.

- Scheduling. The Student must select from and participate in a series of instructional alternatives as he progresses through the system. Staff members and facilities must be scheduled accordingly.

  Attitude Monitoring. The monitoring of a Student's attitudes toward instructional alternatives, staff members and instructional methods will play an important part in the control of the model program. One use of this type of data will be to evaluate the effectiveness of routes to performance criteria.

Administrative Subsystem. The functions performed by this subsystem include supplying materials, professional staff, and non-teaching personnel; allocating funds; and coordinating the program with the rest of the university and with external agencies.

Information Subsystem. The Model Elementary Teacher Education Program will require the collection and analysis of large amounts of data for system control and monitoring. Information must be readily available for decision-making. (For example, Students must be able to reschedule an instructional alternative within a short period of time.)

Data which will be contained within this subsystem will involve: (a) aptitude and achievement data stored in the control subsystem; (b) sequence of learning experiences selected, as well as some measure of sequence effectiveness in relation to goals; (c) costs in resources and in student and faculty time to meet each performance criterion through each instructional route; (d) system status of each student, i.e., what performance criteria he has met and what educational alternatives he is now engaged in for meeting which additional performance criteria; and (e) utilization and availability of training resources including staff, equipment, and facilities.

Placement Subsystem. Unless the teacher education program produces for a market, the system will become inoperative. One of the important tasks of the placement subsystem will be to disseminate information about the teacher training program and its graduates to prospective employers. In addition, the subsystem will determine qualifications and vocational interests of students, determine employment opportunities, and match students to positions.

Educator Subsystem. The main body of the student's training is organized under the educator subsystem. This subsystem can be segmented into two not completely distinguishable components: human and automated. The human component involves such activities as lectures, seminars, and observations, while the automated component involves use of teaching machines, programmed instruction, and videotaped lectures.

Analysis Subsystem. Feedback regarding the quality, success, competency, acceptability, and competitiveness of program students and graduates is provided by this subsystem. This information is used to add, delete and modify performance criteria. Student performance (and indirectly, the effectiveness of stated performance criteria) is measured using rating procedures, video tapes, archival data, and job placement of students. Comparative analyses are made of three groups: program graduates, graduates of other teacher education programs, and experienced teachers.

Figure 8 is a simplified diagram of the relationships of the above subsystems.

Placement and Follow-up

The placement service of the Massachusetts Model Teacher Education Program will seek out schools in which the potential of teachers may be fully realized. These schools will have, or will be moving toward, differentiated staff organizations.

The functions of the placement service include personnel diffusion, follow-up, feedback, and evaluation. In its diffusion function, it will build a career file of information about school districts and students, and will notify employers and graduates of possible openings and possible candidates.

The follow-up and feedback function is an on-going process of information gathering from teachers already placed. Teachers will report significant changes in position, salary, and educational circumstances. They will also comment on attitudinal changes and on other personal areas that may be relevant. The evaluation function will insure reassessment and continuous modification of the teacher training program. It will permit the training institution to obtain criticism and suggestions from its graduates and from the schools in which they are placed.

Special Features

The in-service training program in the Massachusetts model is based on hierarchies of differentiated performance criteria. The sequence of training strategies used at any given time is adjusted to suit the learning needs of a particular teacher. For example, a teacher interested in applying for an upper level position would be made aware of the particular

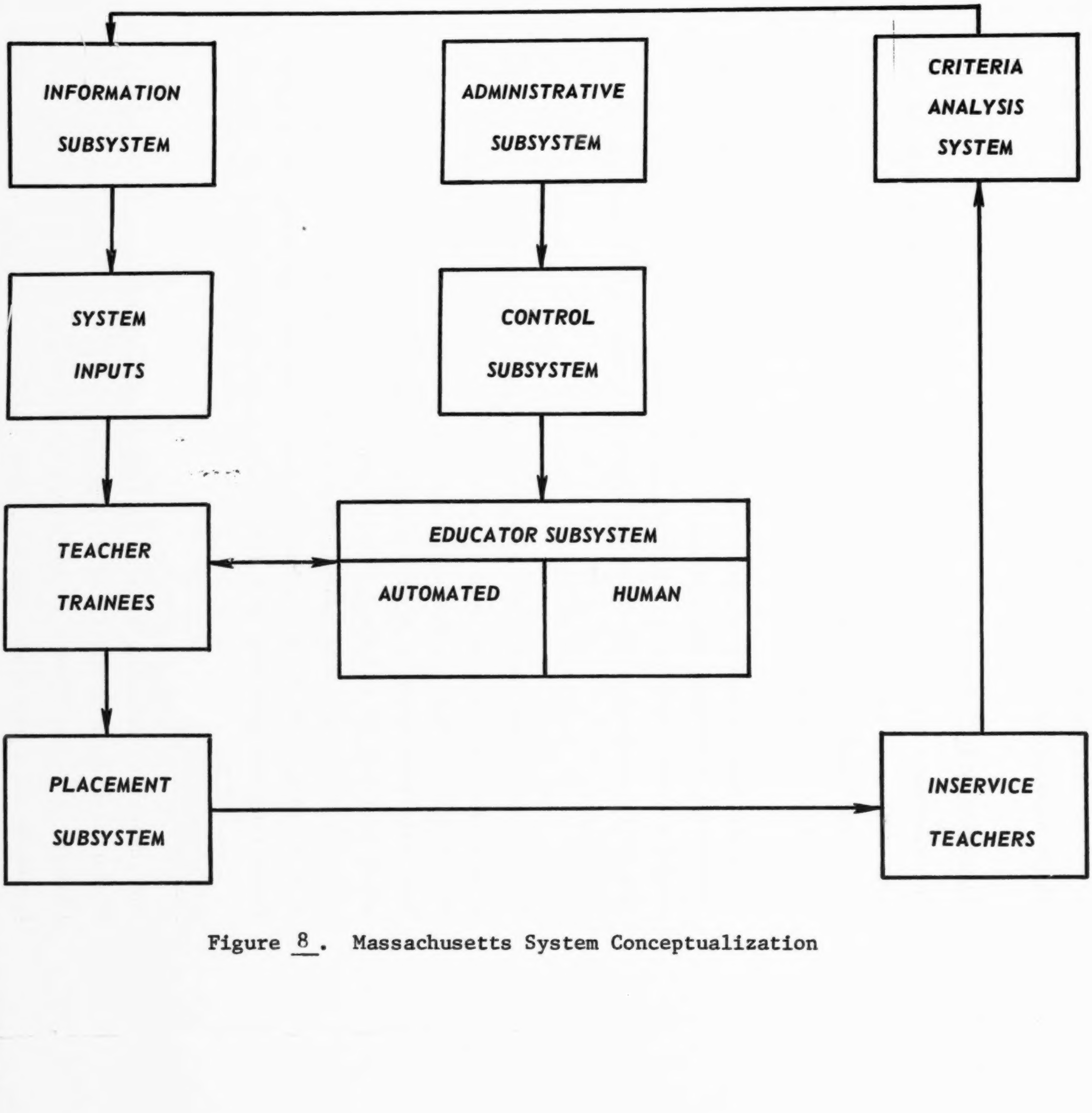

INFORMATION SUBSYSTEM
ADMINISTRATIVE SUBSYSTEM
CRITERIA ANALYSIS SYSTEM
SYSTEM INPUTS
CONTROL SUBSYSTEM
TEACHER TRAINEES
EDUCATOR SUBSYSTEM
AUTOMATED
HUMAN
PLACEMENT SUBSYSTEM
INSERVICE TEACHERS

Figure 8. Massachusetts System Conceptualization

set of performance criteria required, and would then select training experiences from among those available. However, not all in-service assistance would be oriented toward advancing to higher levels within a differentiated staffing structure. Different roles at the same level could be learned; specific difficulties in teaching could also be remedied by in-service training.

THE BEHAVIORAL SCIENCE ELEMENTARY TEACHER EDUCATION PROGRAM OF MICHIGAN STATE UNIVERSITY

Overview

The behavioral sciences provide the knowledge and principles from which the Michigan State University model was constructed, and they account for a considerable part of the teacher training curriculum. The model seeks to focus behavioral research on educational problems and the development of pre-service and in-service programs of teacher preparation.

Instructional Goals

The model has three basic goals: (1) to produce an elementary teacher who uses a clinical behavior style of teaching, who is a competent student of human learning, and who acts responsibly as an agent of social change; (2) to introduce the use of research and clinical experience to the decision-making process as a basis for educational improvement; and (3) to establish, as a part of the teacher training organization, a new kind of laboratory and clinical base for the pre-service and in-service training of teachers.

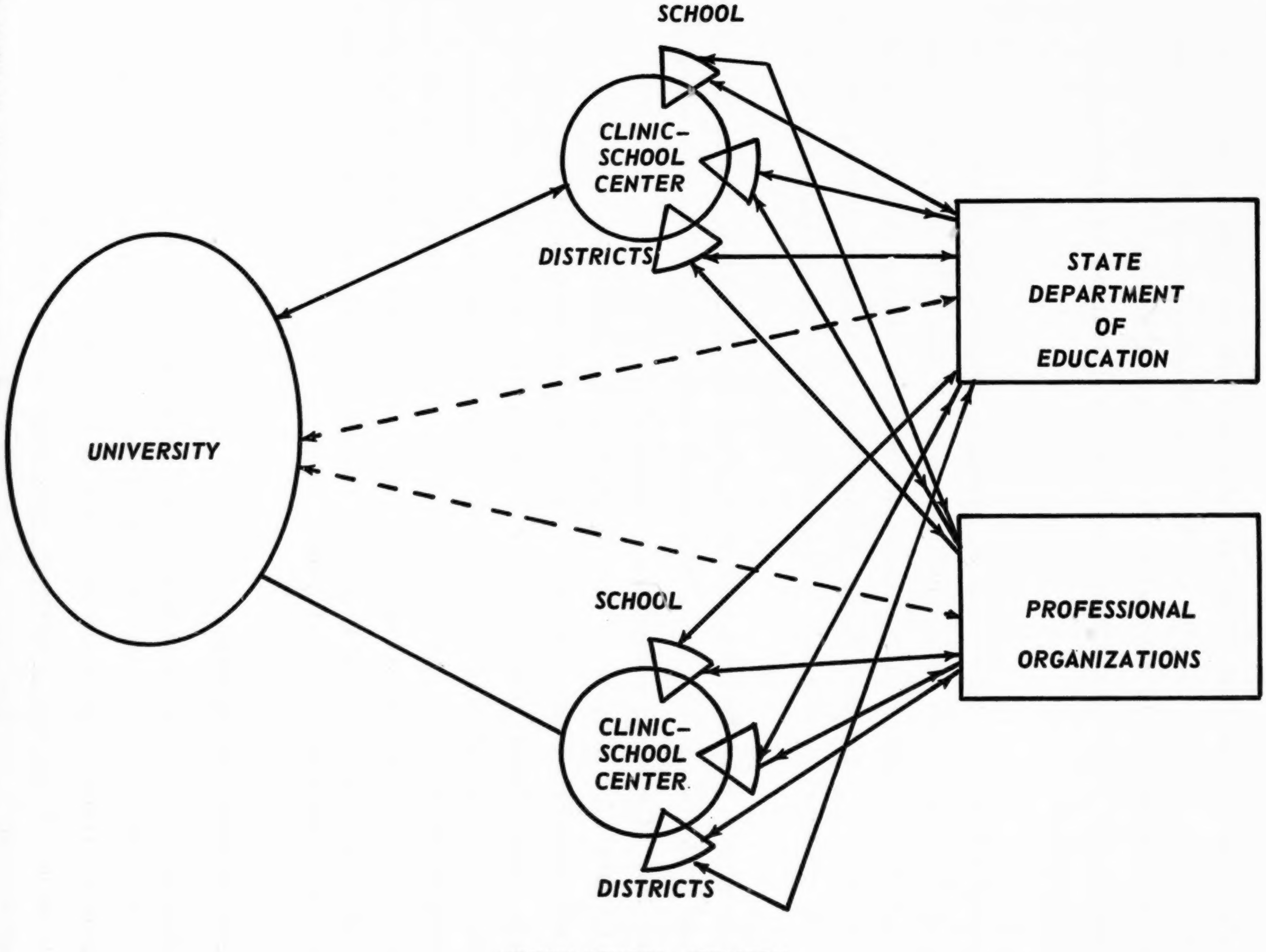
The clinical behavior style is a set of behaviors and modes of thinking which permits a teacher to use his pupil-related experiences as a basis for learning how better to teach. The set of behaviors is cyclic and is composed of a "doing" or practical level, and a theoretical level which includes reflecting and proposing. On the practical level, the teacher engages in teaching behaviors and seeks evidences of the consequences of his behavior. On the theoretical level, he reflects upon and evaluates these consequences, and he formulates hypotheses about their reasons and the possibilities of improving them. He then prescribes for himself a set of improved teaching behaviors and is ready to return to the practical level. Much of the training program and of its component clinical experiences is devoted to this clinical behavior style. It is considered one of the important steps in the direction of professionalizing education.

Virtually the whole of the teacher training program contributes to the role of the teacher as a responsible agent in social change. The combination of the general liberal education curriculum with the clinical studies and the scholarly modes of knowledge is directed toward assuring that the professional teacher's social impact will be a responsible one.

The laboratory and clinical base envisioned as the third goal is designed so that students can encounter youngsters in both school and out-of-school situations. The major constituent agency will be a clinic elementary school, part of a network of such schools being established to provide pre- and in-service experiences. Other agencies which will be involved include summer camps, recreation programs, YM or YWCA's, and settlement houses. Indeed, the clinic school will seek a broad base of community interaction as well as linkages with universities, professional associations, and the state department of education. This coalition of agencies and organizations will contribute to all three of the model's principal objectives (See Figure 9 next page).

Overall Program Organization

The program is chiefly an undergraduate program with one year of internship. The curriculum is divided into five interrelated general areas. The general liberal education area may be considered the cornerstone of the program. A scholarly modes of knowledge area organizes liberal arts subjects related to elementary curriculum so as to encourage the student's development of scholarly attitudes. The program seeks to develop creative teachers by promoting an attitude towards learning which fosters originality in working with students.


SCHOOL
CLINIC-SCHOOL CENTER
DISTRICTS
STATE DEPARTMENT OF EDUCATION
UNIVERSITY
SCHOOL
PROFESSIONAL ORGANIZATIONS
CLINIC-SCHOOL CENTER
DISTRICTS

CLINIC SCHOOL NETWORK

Figure 9. Interrelationship of the Michigan State Clinic-School Network

The professional use of knowledge component introduces strategies of instruction for specific elementary school subjects, while the human learning component deals with human learning, its variability among learners and its general principles. This component complements the professional use of knowledge by relating it to the nature of learning and hence the student's development of creative and flexible teaching strategies.

The clinical experiences component begins in the first year of training and extends through a year of teaching internship. The student learns about the real world of teaching and acquires skill and competence in working with children. He gradually becomes accustomed to accepting his role as a teacher and to interacting productively with other members of the school staff.

The student may choose to specialize in one or more elementary school subjects or in a particular age level. A new teacher role, the subject matter specialist, has been identified and is trained for by the program. The model also provides training for two prominent auxiliary roles which are emerging as important when instructional staffs are differentiated. The first, an associate teacher, works as a paraprofessional member of a teaching team. The other, a media specialist, is responsible for procuring and preparing media resources.

Since completion of pre-service teacher education only begins a professional teacher's preparation, the model develops the concept of continuing in-service education. A college or university will cooperate with one or more school systems to design programs to meet teachers' individual needs. Broad-based programs may involve several of the clinic-school centers. A continuous feedback system, operating through the clinic-school network, will signal needed program changes and adjustments.

A viable teacher education program requires a carefully designed, comprehensive evaluation system for the support of program development and contains provisions for varied forms of continuing program assessment. Conceivably, each modular experience, or sequence of modules, may be tested for its contribution to a teacher's development and compared with the results of alternative experiences. The model also contains provisions for assessing student progress at regular intervals, for evaluating professors, and for monitoring student performance during the internship.

An extensive and flexible management system is necessary since this program was planned and will be implemented by faculty members from seven colleges plus representatives from the public schools, pre-school agencies, and students. An Educational Policies Council including the deans of the seven cooperating colleges will assume overall institutional responsibility for general administration of the program. A Project Advisory Committee with members appointed by the deans and representing the seven colleges will form a liaison agency between the Educational Policies Council and the administrative staff of the program. Included on the director's staff will be managers of the subsystem for Program Development. Information Retrieval, Clinical Experience and Evaluation.
The operational phase of the administrative structure will be carried jointly by the College of Home Economics and the College of Education under the direction of the Office for the School of Teacher Education. Students will be admitted and advised by their major department, Family and Child Science or Elementary and Special Education. As a liaison group, the Project Advisory Committee in cooperation with the School of Teacher Education will be concerned about student admission and advisement policies, selection of clinical and laboratory facilities, supervision of clinical experiences, matters of fiscal accounting, relationships between clinical settings and the university, study and review of program practices for the Educational Policies Council, and

teacher certification. Although the Educational Policies Council has final decision-making responsibility on any matter concerned with the program, it is perceived that this body will devote most of its endeavors to the program development and instructional function, assigning the more routine administrative role to the Office of Teacher Education or the College of Home Economics and the College of Education.

Curriculum Design

The Instructional Module. The content and instructional sequences for the five curriculum areas have been defined in single purpose experiences or modules. These modules permit the specification of behavioral objectives, a precise description of the instructional experience, the selection of alternative programs to meet different needs of specific students, and a method for curriculum change and modification. Hundreds of modules have been constructed, and short, standardized descriptions of each one are computer stored in a natural language computer form. The module can be located by a five digit index number, and each line within a module can be located by a reference number.

The module description starts with a statement of its objectives. Following this statement is a list of experiences considered prerequisite for satisfactorily attempting the present module. Next is a description of the educational experience which constitutes the module. A line called "setting" gives the size of the study group and the site of the study. Instructional materials, approximate hours of study time, and methods of evaluation are designated. A statement of level indicates the module's appropriateness for early childhood, later childhood, or all students. The module is also designated as general or specialized in content.

The Clinical Experiences Area. The initial series of clinical experiences are organized into a Career Decision Seminar. This format provides opportunities for the student to engage in such activities as simulations, self-evaluations, role study, and work with individual children in school and non-school settings. Through these activities the student broadens his understanding of children and decides, based on his experience, whether he wants to become a teacher. If he decides to continue in teaching, he will later choose a specific age group and/or teaching role for himself.

The Career Decision Seminar has been designed to move the student rapidly from a student-oriented role to a professionally oriented role. It is assumed that the student is unfamiliar with elementary teaching, even though he attended elementary school, and he is, therefore, introduced to the world of teaching through these experiences. He learns early to relate as a team member with other professionals in the school and classroom, assuming first the responsibilities of teacher aide and progressing, by the end of the internship, to full teaching status. The emphasis throughout this program is on the student's active participation in teaching activities.

These activities take place in a campus simulation laboratory and in the clinic school. Various kinds of teaching experiences have been recorded on video tape and are used as a basis for discussions and counseling as the student strives to develop a variety of teaching styles and behaviors. These simulated activities prepare for and reinforce the student's classroom involvement.

An important part of the clinic school's training and research functions is the provision of experiences for students and interns. Through the clinic school, the student becomes a part of a referent group--other students, teachers, and specialists--who support his attempts to acquire classroom skills. The clinic school faculty, because of its involvement with instructional improvement, is prepared to serve as intern consultants or instructor-critics for visiting pre-intern students.

The internship is the capstone of the clinical experience sequence. During his fourth year, the student is assigned to one of the schools within the clinic-school network. He is on salary and, depending on the program, he is either in charge of an elementary classroom or he functions as a specialist. In cooperation with his intern consultant, the intern develops a progress achievement plan based on cooperatively defined standards and goals. He determines the problem-solving skills he needs to develop and evaluate.

General Liberal Education. General liberal education in this program prepares the student broadly for life through concentrating on three general areas: the humanities, social sciences, and natural sciences. The humanities concentrate on the methods of the artist and the writer, especially their perceptions of reality and their methods of communication. The social science component seeks to develop the methods for problem-solving and decision-making, while the program of natural sciences delineates underlying principles by viewing scientific method as a process affecting the whole of contemporary culture. Since knowledge is expanding at too rapid a rate for a concentration on the acquisition of facts, students are involved in the process of the disciplines and become active participants in the modes of inquiry.

The general liberal education program focuses on processes and principles. The modular format permit flexible program planning. Individualized instruction and self-evaluation provide mechanisms for student planning. Since the "entry behavior" (prerequisite) and the "terminal behavior" (goals) of each modular experience are specified, the modules can be adapted to a variety of program outlines.

The curriculum fosters individual attention to the intellectual needs of the students through careful testing and accurate and continual counseling to place them at the level of achievement most appropriate to their past experience. The self-evaluation is achieved through specification of the goals and corresponding evaluation procedures. If the individual student evaluations show that few students reach the behavioral goals, the faculty has reason to suspect a deficiency in the structure of the module.

The humanities component introduces the student to a range of meanings and insights about human behavior that do not admit to laboratory analysis but are, nevertheless, basic characteristics of civilized life. The goal is to offer an intellectual environment in which the students may develop effectiveness and responsibility as citizen-teachers. Content is derived from the fields of art, music, literature, philosophy, religion, and history.

The humanities component is organized as a two-year sequence in western civilization followed by a sequence dealing with non-western cultures. Each part of the humanities performs a different function in the overall plan, but all parts share the common goal of involving students in the great issues of their heritage.

The social sciences component serves as a general introduction to the social science disciplines. The instruction deals with how the social scientist works, the problems he attacks, how he solves them, and the rationale for his decision-making. Following several sessions on the nature of social science, the year-long component develops the rationale for geography, anthropology, sociology, political science, and economics.

Because of the overlapping knowledge of the social and behavioral sciences, experiences in this component are extremely important in the development of the teacher envisioned by this model. The final weeks of the program are spent reviewing the major problems and contributions of the respective social science disciplines.

The natural science and mathematics component program in a freshman-sophomore level program planned to begin the differentiated preparation of the teacher for a role as a citizen-educator. The emphasis is geared toward those skills needed by any active member of our society. Science I, Science II, and Mathematics are designed to be taken in that order. The goal is to acquaint the student with underlying principles, to examine the effects of scientific processes on the culture and the individual's ways of thinking about life.

Three major themes are pursued in the science component: cosmology, mechanism, and evolution. Cosmology traces the historical development of scientific ideas; mechanism examines the structure of scientific knowledge by analyzing contrasting theories. The evolution theme serves to emphasize the problems encountered when scientific knowledge interacts with the non-scientific world.

The underclass level experiences in mathematics treat the historical development of mathematics as a background for its place in our technological culture. Emphasis is placed on the mathematician's view of his field and the application of mathematical principles to problems in the physical and social sciences. The student is expected to engage actively in the mental processes developed and illustrated by the instructor and to challenge, question, and examine the propositions offered.

Scholarly Modes of Knowledge. This curriculum area is designed to aid the prospective elementary teacher to bridge the knowledge gap between the generations in certain significant areas. It differs from the General Liberal Education component by being directly applicable to teaching in the elementary school and by stressing the modes or styles of scholarly inquiry. Broad principles, relatedness of ideas, generalizations, and applications in various contexts are emphasized. Ideas from current experimental elementary programs form the basis for content selection. Among the components are linguistics, communication, literature for children, fine arts, social science, natural science, and mathematics. The process of translating ideas from the disciplines into teaching-learning strategies suggests interrelationships with the professional use of knowledge area, and the two may be treated separately or together. In this respect, an integration between general education and professional training can be achieved.

Professional Use of Knowledge. This area helps a prospective teacher to integrate what he knows about learning as it is accomplished by human beings and to translate this integration into instructional strategies.

The component parts of the Professional Uses of Knowledge are aligned with five subject areas--reading, language arts, social studies, natural science, and mathematics--an organization consistent with the subject-centered curriculum revolution currently sweeping the country. Natural science studies, for example, are built upon and integrated with earlier academic experience in science. To accomplish this integration during the preparation of the program model, teams were organized so that the writers from all three areas (General Liberal Education, Scholarly Modes of Knowledge, and Professional Use of Knowledge) worked together to select and assign content and approaches to various components. Thus, some experience modules in Scholarly Modes of Knowledge are closely akin to modules in Professional Use of Knowledge, while other experience modules in each area represent the introduction of content unique to that area.

The theoretical base, the subject organization, and the teaching content support one of the basic assumptions of this teacher education model:

that clinical analysis in instruction is superior to blind obedience to a textbook or any other form of inflexible curriculum.

Human Learning. This curriculum area focuses upon the learner and the daily cognitive-affective forces and experiences which are likely to influence his behavior inside and outside of school. Analytic tools for studying human behavior, drawn from the behavioral sciences, furnish a cornerstone for the program. Five criteria served as guidelines for the selection of material for this component.

The first criterion is that the material must provide a basis for an understanding of all human learning. Secondly, it must account for and provide a basis for understanding the factors which affect learning. Also, the material must make reasonably good predictions about the outcome of learning and teaching activity. The material must be a potential source of hypotheses that can be tested in the classroom as well as the laboratory. Finally, it must reflect more than a single point of view on the nature of learning.

The component, as it currently exists, is divided into five areas, three of them subsumed under the heading Human Learning I and two under the heading Human Learning II. The first part of Human Learning I is Behavioral Science Research-Based Study of the Growth and Development of the Pre-School Child. The second is Behavioral Science Research-Based Study Focused upon Education Psychology. The third is Behavioral Science Study Focused upon Social-Philosophical Foundations of Education.

Human Learning II starts with Advanced Behavioral Science Research-Based Study Focused Upon Education Psychology. It is followed by Advanced Behavioral Science Study Focused upon Social-Philosophical Foundations of Education.

Institutional Relationships

The program has been designed so that it can be adopted by other institutions in one of two ways. First, the standardized format of the instructional module, including the natural language computer storage file system, permits another college to use a part or all of the modules. Secondly, the interrelationships of clinic-school networks, community organizations, and colleges provides a mechanism for linking other schools to the program.

The clinic-school network also provides an instrument for the continuing, in-service development of the teacher. Programs which integrate the resources of universities, local school districts, community agencies, professional organizations, and state departments of education can be implemented through the clinic schools to answer the increasing demands for in-service teacher education.

Innovative Features

The creation of a large menu of experience modules is the major innovation in this module. Since they can be combined in a number of ways, programs can be individualized according to individual learning styles or needs. In this respect the model has been developed to relate a student's previous knowledge and experience to the university teacher education program.

The model has attempted to integrate the university, the local school district, and other agencies involved in teacher education through the mechanism of the clinic school network. These linkages not only facilitate feedback and evaluation but assure a developmental program of clinical experiences. Simulated activities carried out at the college can be reinforced through experiences in the school. Important techniques for this program are the Career Decision Seminar and the use of videotaped simulations.

Student Guidance

Guidance is an integral part of each program component. Each module requires that the student possess certain entrance characteristics and that upon completion he achieve clearly defined learning levels. A profile based on this information permits continuous monitoring of a student's progress.

The clinical experiences component, beginning with the Career Decision Seminar, provides a mechanism for career decisions and related personal choices. By establishing both a mechanism and a referent group, the seminar can support and direct the student.

The student is guided by an intern consultant during the practicum and internship at the clinic school. This highly skilled teacher has been selected to work full-time with the intern teachers. A related role is performed by the faculty counselor who helps the student analyze the situations he encounters in the simulation laboratory.

Management and Control

The entire model program is the responsibility of the project director, who is assisted by the Dean's Educational Policy Council and a Project Advisory Committee. Administrative and operational functions have been assigned to the Office of Teacher Education in cooperation with the College of Education and the College of Home Economics.

The Project Advisory Committee, composed of faculty representatives from the seven cooperating colleges, will maintain a close liaison with the project director and his staff. This group performs a study-review planning function and reports to the Council of Deans on matters directly concerned with the development and implementation of the program. Members of the Advisory Committee representing the College of Education and the

College of Home Economics will refer operational and administrative problems to the Committee, which, in turn, will make recommendations to the Educational Policies Council on matters of general policy, the establishment of priorities, the allocation of resources, and problems of conflict among parts of the system.

Program management has been organized in four subsystems. The Program Development Subsystem is concerned with the development and implementation of non-clinical student experiences. It functions as an organizing mechanism for the individual learning modules. The Information Retrieval Subsystem has been designed to handle the location and storage of the learning modules and to monitor and control data on individual students.

A Clinical Experience Subsystem is designed to develop and organize simulated and real experiences for students. It also serves as a mechanism for incorporating program changes based on new information from studies of the teaching-learning relationship. Feedback from these three subsystems has been assured by the establishment of an Evaluation Subsystem. Both program and individual evaluation methods will be used to insure that the model is meeting its goals.

Placement and Follow-Up

While the model does not detail a placement program, it is anticipated that the student profiles maintained through the Information Retrieval Subsystem and the school contacts evolved through the Clinic-School Network will form the basis for appropriate placement of a student. Follow-up will be achieved as part of the in-service program also established through the Clinic-School Network.

Special Features

A new faculty position, the Intern Consultant, builds a helping relationship with the intern by concentrating on the practical rather than the theoretical aspects of the student's development. As a member of the Clinic-School faculty, he works individually with interns.

The Information Storage and Retrieval System provides a means for handling student records, research data, clinic-school information, and other data pertinent to program operation. Experience modules are stored in it. Index terms and selectivity of retrieval aid in program analysis. With the addition of new modules or the modification of existing ones, the system can be readily updated to provide a current program description. The system is machine independent, and a college choosing to adopt the model would in no way be dependent upon the computer activity at the Michigan State University.

A COMPETENCY-BASED, FIELD-CENTERED, SYSTEMS APPROACH TO ELEMENTARY TEACHER EDUCATION (COMFIELD) PROPOSED BY THE NORTHWEST REGIONAL EDUCATIONAL LABORATORY

Overview

The Competency Based, Field Centered (ComField) Model is designed to develop a teacher who can effect changes in pupil behavior so that these changes reflect desired outcomes. The model prepares the teacher in four ways: (1) to effect pupil change, (2) to perform the non-instructional tasks in the school setting, (3) to demonstrate effective interpersonal and group skills, and (4) to integrate professional skills into a personal style.

The model presents a process which requires its user to (a) know what it is that he wants to accomplish, (b) order events in such a way that there is some probability of achieving them, (c) assess the ability of events to achieve the goals, and (d) modify the process as necessary. Students are made aware of the process of deliberate planning as they move through the steps of the model because they experience the curriculum and they use the process to plan their teaching.

The ComField model is formed of two distinct parts: a model for an instructional program and a model for a management system to support the instructional program.

Major Themes

The model's development was based on a set of principles describing the nature of teaching and the planning of the teaching situation. Operationally, prospective teachers must be able to demonstrate that they can effect changes in pupil behavior which reflect desirable educational outcomes before they assume responsibility for guiding the learning of children. The same rationale holds with respect to demonstrating the ability to perform non-instructional tasks.

The concept of competence in the ComField teacher education program is complex, but it underlies the whole structure of the model. Competence is bringing about appropriate changes in pupils, and it is judged by pupil change, not by the teacher's ability to perform abstract, generally appropriate behaviors. The emphasis in the model then is not to identify classes of teacher behaviors but to specify pupil outcomes and from these to build instructional systems.

Four sets of variables are always interacting in any demonstration of competence as a teacher of children: (a) the pupil outcome desired; (b) the characteristics of the pupils which interact with instructional conditions to effect outcome; (c) the characteristics of the instructional setting which interact with both pupil characteristics and instructional conditions to effect outcome; and (d) the nature of the instructional act *per se*. As used in ComField, the term "instructional act" always includes reference to both the content of and the strategy represented by an instructional behavior. Much the same set of operations are involved when referring to competence in the performance of noninstructional tasks: to demonstrate competence in conferring with parents, for example, a prospective teacher must be able to demonstrate that he can bring about a given outcome for a given parent within a given context.

Since the demonstration of competence within the ComField teacher education program always requires an appropriate mix of teacher behavior in relation to outcome, characteristics of the target population, and characteristics of the setting, competence is always situation specific.

That is, it can be judged only in terms of a specific mix of such variables. As a consequence,competence cannot be thought of in an abstract or generic sense; *competence in instruction must always be thought of in terms of the ability to bring about a specific outcome for a specific child or set of children who have specific characteristics and who are operating in a specific instructional setting*. Competence is getting a 6 year-old child in a class of ten who is bright but visually handicapped to be able to discriminate between all letters of the alphabet, or in getting a 13 year-old boy of average ability in a class of thirty, with little exposure to cultures other than that reflected in his own relatively isolated mountain community, to place value in cultures other than his own.

Such an approach to the concept of competencies has major implications for assessment, since the specific situations within which competencies can be demonstrated are by definition endless. Operationally this requires that the strategy of assessment involve the demonstration of competence in situations which appropriately sample classes of outcomes for classes of target population within classes of educational settings. A basic assumption underlying the program is that each prospective teacher will be able to negotiate the specific situations in which he is to demonstrate competence, and that these will reflect the type of situations that he will be encountering in the setting within which he chooses to teach.

A note of caution should be introduced at this point. While the logic of the steps for producing a systematic design of a teacher education program is clear, the existing information base from education and psychology on which the design of such a program depends is limited. As a consequence it is not possible to go very far in specifying the knowledge, skills, and sensitivities that prospective teachers need in order to create effective learning conditions. There is a similar lack of knowledge about the kind of teacher education program which will develop these competencies. As a consequence of such a limited knowledge base, the design of the teacher education program must of necessity be built as much on the basis of the collective wisdom of those who are helping shape it as on the basis of firm empirical evidence. To minimize the limitations inherent in such an approach, the model specifies that the methodology of instructional systems design and development be used. This methodology permits, through interactive cycling and empirically-based feedback procedures, the development of an instructional program which will produce specified outcomes with known degrees of reliability.

The ComField model is based on two predictions about the nature and purpose of education in the 1970's. These concern the development of the field of education and the emerging teacher roles. The first prediction depends on the evolution of a functional and science technology of education which will cause two major changes in the education of children. The first change will be the widespread use of self-instructional materials. The second will be the use of systems design principles for organizing instructional experiences. Together, these changes will lead to the increased use of "instructional systems" for the education of children.

The second prediction sees the emergence of three distinct educational specialists in place of the present unified concept of the teacher, and the three will function as a team. An instructional analyst will identify pupil outcomes and the instructional conditions for achieving them. An instructional designer-engineer will design instructional systems to achieve the outcomes. The third member of the team, the instructional manager (or IM) will be responsible for creating and maintaining the instructional environment that brings about learning in children. The IM will relate the pupil to the learning process by diagnosing learner readiness, prescribing appropriate learner experiences, and evaluating pupil progress. He will also apply the instructional systems developed by the other members of the team, supervise "instructional assistants," and direct the use of educational technologies. In brief, the instructional manager controls and supervises the processes of instruction.

Instructional Goals

The ComField model at present is concerned only with the training of instructional managers. The principles established by the model permit developing programs for training instructional analysts and designer-engineers. The instructional manager, therefore, can be defined more specifically than the other two. In the ComField model, the single purpose of teaching is to bring about learning, and this definition limits and defines the task of the instructional manager. *Learning* in the ComField model means a specified change in pupil behavior. Therefore, the effective instructional manager is one whose pupils *demonstrate* appropriate changes in behavior.

In the task of instructional manager, the individual will perform two distinct sets of functions. These are identified in the model as:

(a) Role I: The facilitator of the desired outcomes in children.

(b) Role II: The performer of the non-instructional tasks required within the school.

Role II, in addition to the visual instructional support functions of keeping records, conferring with parents, ordering supplies, and working with professional organizations, will be expanded by these predicted changes:

- increased responsibility for research and evaluation within the context of ongoing educational programs.

- increased individualization of instruction through use of predesigned instructional systems, electronic media and computer technology.

- increased dependence upon instructional aides or assistants.

- participation in administrative decision-making regarding policy, curriculum, and school management.

The purpose of the ComField program is to train an instructional manager who can perform these two major roles while developing an individual teaching style within the context of a changing and emerging educational universe.

Overall Program Organization

Since the primary objective of the teacher education program is the development of instructional managers, that is, persons who will perform Role I and Role II, a systematic analysis suggests four steps for the planning of the programmed training, as follows:

Step 1	Step 2	Step 3	Step 4
Pupil outcomes that are desired.	→ Conditions that bring about the pupil outcomes that are desired.	→ Knowledge, skills, and sensitivities needed by teachers to provide the conditions that bring about the pupil outcomes that are desired.	→ Conditions that bring about the competencies teachers need to provide the conditions that bring about the pupil outcomes that are desired.
The goals of education	The instructional program within the schools	The goals of teacher education	The teacher education program

Step 4, however, is concerned with developing the knowledge, skills, and sensitivities required by the teacher in a specific situation, dealing with a specific pupil. This strategy puts information into the heads of students in an interrelated, situation-specific way so that it can be used to achieve desired outcomes. On the basis of this analysis, the ComField model was designed to prepare instructional managers.

Curriculum Design

The ComField model includes two distinct stages of development: laboratory experiences and a teaching practicum. For each stage, measures of criterion performance have been specified so that each stage can be defined in terms of knowledge, skills, and sensitivity competencies, which can be practiced under simulated or live classroom situations. Each stage contains a series of foundation systems which provide the student with information about instructional strategies, instructional content, learner characteristics and setting characteristics. A student may first choose to try out a teaching behavior in the laboratory and then, having isolated his needs, study appropriate foundation systems. He might, however, choose to study some foundation systems before attempting to practice a teaching behavior. In this manner, a high level of flexibility between information and practice is maintained.

Taken together these activities define the requirements for a learning system to produce instructional managers. The test of the strategy for educating the student of teaching is that the student will demonstrate to criterion level the behaviors which were identified as evidence of the effective instructional manager. The model for a teacher education learning system, therefore, consists of four elements:

- A statement and explanation of the desired outcomes for instructional and non-instructional tasks.

- A procedure for assessing each learner's entry level in relation to the desired behavior.

- Alternative sequences of learning activities in which each learner:

  a. Successively completes behaviors which constitute essential steps leading to the objective,

  b. Demonstrates an advanced level of entry behavior, and consequently bypasses selected essential steps leading to the objective, or

  c. Demonstrates a deficiency and meets prerequisites leading to the objectives.

- A criterion task in which the learner demonstrates the behavioral objective in terms of a situation specific performance standard that meets the requirements of a generalized performance standard.

The foundation systems supply the future instructional manager with foundations of knowledge as a basis for educational decisions that will cause the desired outcomes in pupils. This requires judgments about the appropriateness of content and strategy to reach a given performance for a given pupil or set of pupils in a specific instructional setting. Three kinds of foundation systems will be required for the preparation of instructional managers: (1) systems to provide conceptual frameworks for teaching the basic concepts of disciplines, (2) knowledge about instructional strategies appropriate for use in bringing about given classes of learning outcomes, and (3) knowledge about learners and the conditions of learning. Parallel funds of knowledge will be needed to prepare the instructional manager to perform the non-instructional tasks for which he will be responsible. (See Figure 10, next page.)

The laboratory is the critical preparatory phase of the ComField model's instructional program. In the laboratory the student, about to become an instructional manager, has opportunities to practice,under simplified, simulated conditions, each of the significant behaviors which are essential for effective instructional management. The laboratory gives the individual student the chance to progress through phases of the instructional systems which provide opportunities for the appropriate practice of the behaviors germane to effective instructional management. The prerequisite behaviors will have been analyzed so that practice can be provided for a wide range of an instructional manager's experience. These will include the student's ability to judge the appropriateness of his competencies for use with selected pupils. A number of situations will be encountered in the laboratory so that alternative strategies may be practiced. When the student has satisfactorily achieved the criterion levels established for the laboratory, he will have achieved the requisite entry level behavior for the practicum.

In the practicum the instructional manager works in an actual school situation over an indeterminate period of time. Upon entry the instructional manager is considered competent in the tasks critical to his assumption of responsibilities in the classroom under supervision. In the practicum the instructional manager extends the competencies of teaching he demonstrated in the laboratory and learns new ones. He is also able to explain why his performance is consistent with a rationale of teaching and to justify his choices of objectives

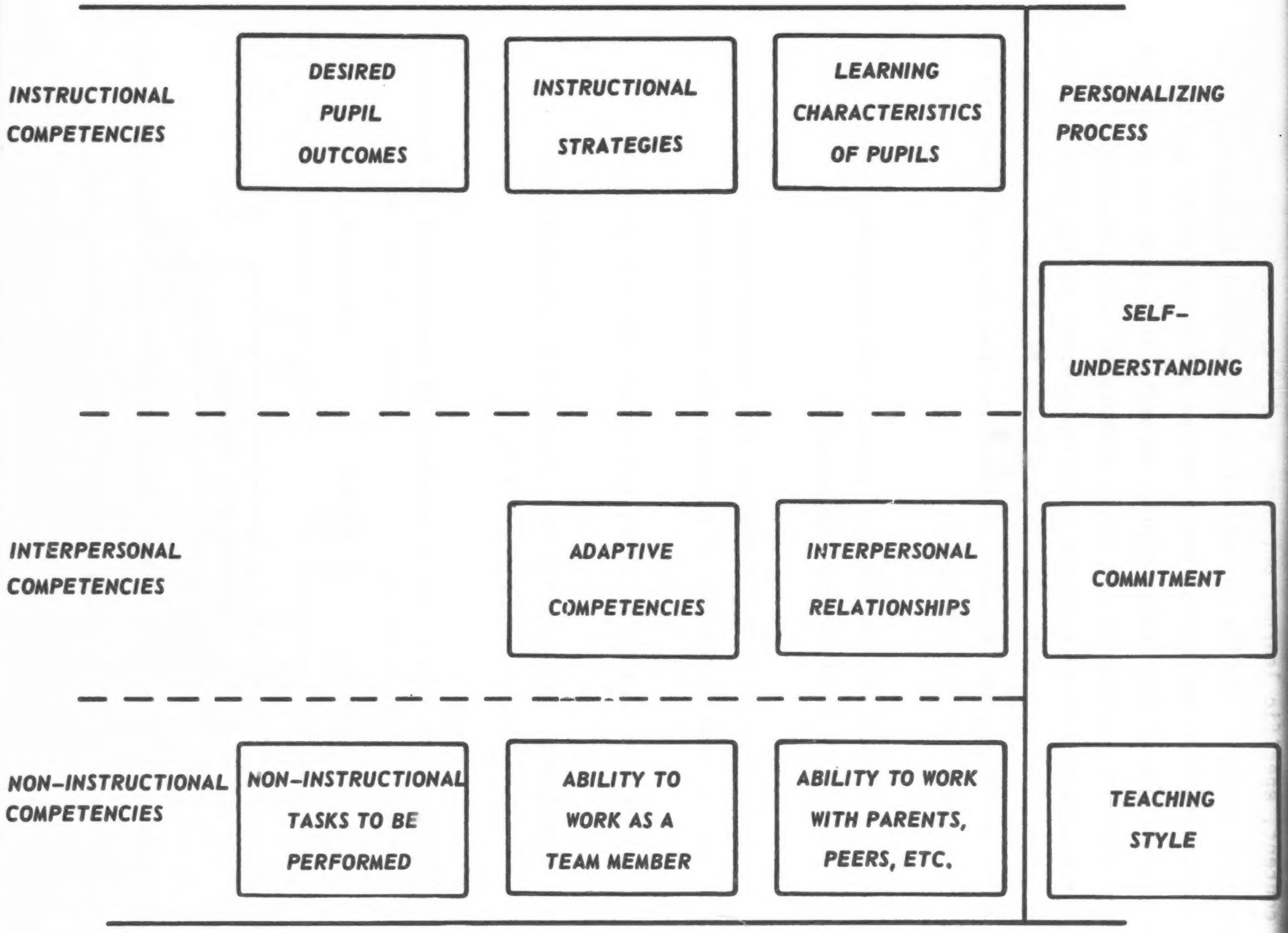
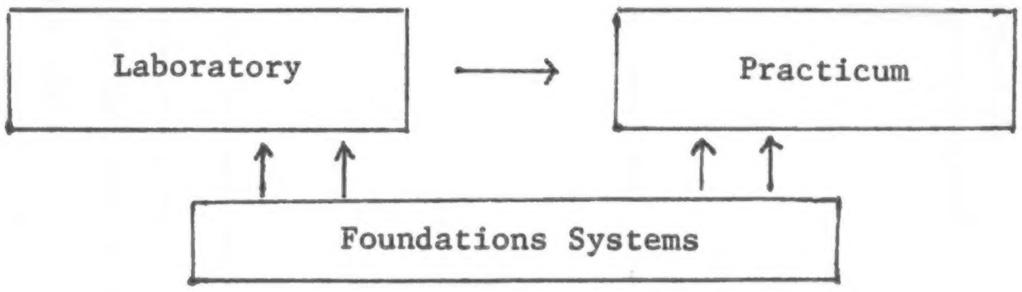

INSTRUCTIONAL COMPETENCIES
DESIRED PUPIL OUTCOMES
INSTRUCTIONAL STRATEGIES
LEARNING CHARACTERISTICS OF PUPILS
PERSONALIZING PROCESS
SELF-UNDERSTANDING
INTERPERSONAL COMPETENCIES
ADAPTIVE COMPETENCIES
INTERPERSONAL RELATIONSHIPS
COMMITMENT
NON-INSTRUCTIONAL COMPETENCIES
NON-INSTRUCTIONAL TASKS TO BE PERFORMED
ABILITY TO WORK AS A TEAM MEMBER
ABILITY TO WORK WITH PARENTS, PEERS, ETC.
TEACHING STYLE

Figure 10. ComField Instructional System

for content, specific learner outcomes, and characteristics of the individual learner. During the practicum the student is introduced to and practices those additional competencies which constitute the professionalization of the instructional manager, including the skills of working with his colleagues and other members of the community. The practicum is designed to last one to three years. During this time the instructional manager will increase his range and depth of knowledge and other teaching competencies. Graduation from the practicum will be based on evidence of the following:

- Significant and observable gains in the competencies of effective instructional management.
- Commitment to choosing appropriate instructional objectives and appropriate means of implementing objectives.
- Commitment and skill in analyzing his own performances.
- Commitment to designing his program for continuing his improvement as a career teacher.

The ComField model, then, can be graphically represented as follows:



In this structure four main classes of activities may be distinguished:

- demonstration of instructional interpersonal competencies under simulated classroom conditions (the Laboratory phase)

- demonstration of instructional, non-instructional and interpersonal competencies under live classroom conditions (the Practicum phase)

- demonstration of mastery of the blocks of knowledge -- the Foundation Systems -- prior to, or parallel with, the first two classes.

- demonstration that all of the above have been integrated into a unique and personally relevant teaching style.

Generally speaking, the study of one or more foundations systems precedes laboratory or practicum activity. The sequence is not fixed, however, and a student could begin work towards the mastery of a competency by attempting its performance in the laboratory. The practicum, however, does not begin until satisfactory levels of competency have been achieved.

The ComField model, as described so far, accounts for approximately one-third to two-fifths of the student's undergraduate program. In addition to this professional training, the student would be required to meet regular university requirements, including an academic major; but this study functions independently of the basic programs of Comfield Nevertheless, the concomitant development of an academic specialization can serve first to provide the requisite entrance behaviors for the ComField program and the basis for a later specialization as an instructional designer or instructional analyst. The baccalaureate program and the professional preparation, however, are separate from each other. A student may finish his degree before he qualifies for certification, or he may be certified prior to completing the degree.

The ComField model's first phase presents two "levels" of specifications: Model Specifications and Program Specifications. The first establishes broad parameters, and the latter translates these into guides for program development. Both sets of specifications are guidelines for analysis and selection of educational experiences, and, although the model has not done so, it indicates that eventually the program specifications will have to be translated into specific terms for the actual operation of a program. Thus, the ComField model, at this stage, represents a set of principles for the development of a teacher education program.

Institutional Relationships

The ComField model has been designed to fit the on-going program of education to be found in a college or university. While it envisions radical changes in professional education, it requires no reorganization of other undergraduate program components. Each college has its own set of requirements for general or liberal education, and the ComField model specifies that the professional pre-service educational component must accommodate itself to that college commitment. In some cases this will mean that the model-based elementary teacher education program will have to accommodate a discipline major, an interdisciplinary major, or simply a fixed number of hours in general education subjects. The model, however, specifies two requirements of students in the elementary teacher education program:

- They will be involved in general-liberal education experiences throughout the course of the pre-service program;

- They will acquire through their general education experiences the knowledge of disciplines that is prerequisite to entry into instructional experiences--that is, disciplines that lead to mastery of conceptual frameworks for teaching.

Close working relationships with school districts will be necessary. In contrast to being relatively passive hosts to student teachers, the schools will become actively involved at all levels of decision making relative to the program and they will assume major responsibility for instruction and assessment within the practicum phase of the program. This function of the schools does not now exist, and it will be necessary to develop staffs who have a set of competencies that they currently do not possess. The assumption of responsibility for this function will require major change in the operation of schools, a redistribution or reallocation of resources, and a major involvement in an in-service education program as a means of preparing persons to assume their new and enlarged responsibility for instruction and assessment. The model envisions that as much energy will be expended in the practicum as in the pre-service phase, and the cooperating school should be prepared for a close involvement with the program.

The ComField model contains two major specifications for in-service education: first, a systematically designed, performance-based, field-centered and personally relevant in-service education program shall be designed and implemented for instructional personnel in the schools that will prepare them to perform as supervising teachers in the practicum phase of the pre-service education program; second, the instructional systems utilized in the practicum phase of the pre-service training program will be made available to all experienced teachers in a school district that desire or are required to gain the competencies obtainable through their use.

A school district and other participants in the application of the ComField model must be committed to developing an in-service training program. The development of such a program will require an involvement in all the steps prescribed for the designing and implementing of a pre-service program. At this point, however, the specific set of competencies--knowledges, skills, and sensitivities--needed by supervising teachers to carry out the demands of the practicum are unknown. Such competencies, however, must be established within a sizeable portion of school personnel before the pre-service students enter the practicum. Operationally,the development of the in-service program will begin at essentially the same time that the development of the pre-service program is undertaken.

The rationale underlying the division of responsibility between colleges and the schools incorporates the assumption that the college is better suited than the school to exercise responsibility for the development of the knowledge, skills and sensitivities needed to demonstrate competence in the performance of teaching tasks in the laboratory, while the school is better equipped to handle both instructions and assessment relative to the demonstration of competence in the performance of teaching tasks under ongoing classroom conditions. The commitment to having school personnel share equally in the definition and operation of a teacher education program has far-reaching implications for the structure and organization of both schools and colleges.

Four levels of certification are to be incorporated within the model. A Preparatory Certificate permits entry to the laboratory phases and is followed by an Initial Certificate permitting entry to the practicum. The latter resembles a provisional license--one granted with the B.A. and appropriate professional preparation, although, as indicated, the student may or may not have completed his degree because the degree and certification processes are separate. Upon completion of the practicum, the student will receive a Continuing Certificate indicating status as a career teacher. Thereafter, the teacher may receive a Consultant Certificate, qualifying him to supervise students in the practicum or to practice other specializations.

Student Guidance

Specifications for the guidance system are stated in terms of the personalization of professional competencies. The process begins with the explication of entry behaviors and continues throughout the program. The general guideline is stated thus: "Learning is individualized when it is appropriate to the readiness of the information processing style of the learner; learning is personalized when the learner is actively involved in making choices based on confrontations of the relevance of himself to what is to be learned. Personalizing learning recognizes the learner as the ultimate, appropriate decision maker." Three aspects of the personalization process are included in the model:

- Fostering an understanding of one's self.
- Continuous opportunity to explore the value or meaning or relevance of particular competencies for one's self.
- Freedom and encouragement to develop a style of teaching that is in concert with one's self.

The personalizing process includes specifications for self-understanding (based on self-definition, self-awareness, and self-direction), the development of commitment and the emergence of an individual teaching style. There are specific, independent learning experiences designed to bring about the personalization of professional competencies, but the personalization experiences are also a part of each instructional system designed to produce a given competency. They will take whatever form is required to permit the exploration of personal relevance or meaning within the system.

Individual differences in the learning patterns, capabilities and preferences of students in a teacher education program must be more than recognized. They must be taken into account fully in the design of such a program. At the time the ComField model was first designed, concern for individual differences focused primarily on the design of instructional systems with multiple entry points and multiple "critical paths" along which students could move. There were multiple media forms so that information processing preferences could be pursued, the student's rate of progress was under his own controls, and there was opportunity to develop an idosyncratic teaching style. The model's developers later suggested that personalization required a number of additional elements. These include:

- An opportunity for students to contribute meaningfully to the design and development of the program.
- An opportunity for students to negotiate that which they wish to take from the program.
- An opportunity for students to negotiate the settings within which competence is to be demonstrated and to negotiate the criteria by which judgment about competence is to be made.
- An opportunity for students to continuously assess the relevance of the objectives that have been negotiated and the relevance of the educational experiences being pursued in relation to those objectives.
- An opportunity for students to develop a minimal level of self-understanding as a basis against which to make such judgments.

- An opportunity for students to develop an overall style of teaching that is in concert with their self-understanding.

This area, the model suggests, is basic to effective teaching but has received only meager attention from past programs of teacher education. Since most children and adults are operating at a very low level in terms of their potential, the attention to adaptive, interpersonal, intergroup, organizational, and community competencies is seen as essential. The development of interpersonal competencies is based on an interpersonal matrix representing the interplay of social forces affecting the individual. It considers relationships between the student and persons in his immediate family, personal friends, persons in membership groups, persons in occupational-formal organizations, and persons in referent positions. The specifications for the development of the interpersonal-adaptive competencies parallel those required for developing the instructional competencies.

Management and Control Systems

Management is defined in the ComField model as the function of organizing humans in the expenditure of various resources, based on decisions resulting from processing certain vital information, for the purpose of facilitating instruction within a ComField instructional program. The management system is subordinate to the instruction program and exists only to enhance its goals. It must, however, be sensitive to the instructional program and provide an "adaptive-corrective" mechanism so that changes based on evaluation can be incorporated in the instructional model. An important feature of the ComField management system is its linking of the elementary school and the college within the same system so that both have a voice in the operation of the system.

Within the management system ten functions are recognized: instruction, policy, adaptation, program execution, supply, costing, research and development, personnel management, information transmission, and evaluation. The interrelationships among these functions are presented in Figure 11. As with the instructional model, the ComField management model presents specifications which are intended only as broad guidelines for the development of operational designs. The adopting institution could, however, use these guidelines for the exploration of a specific management design.

Three objectives of the management system are reflected by the organizational structure:

- To keep the instructional program squarely in the center of things, and thereby insure as well as possible that the support units remain as support units rather than becoming focal points within the program.

- To provide maximum opportunity for information and directional influence to flow both from the instructional component to the support components, and vice versa.

- To provide for a continuous flow of information to the policy-adaptation component, and hence to the program execution component.

The model cannot guarantee that all units within a ComField program will act in support of the instructional program, but it does provide an operational framework for effectively relating the elements.

Two aspects of the management system require additional comment. The first, the information function, deals with the development of a computer-based information system capable of handling all the information storage and retrieval needs of the ComField program. It is predicted

Schematic Diagram of the ComField Management System

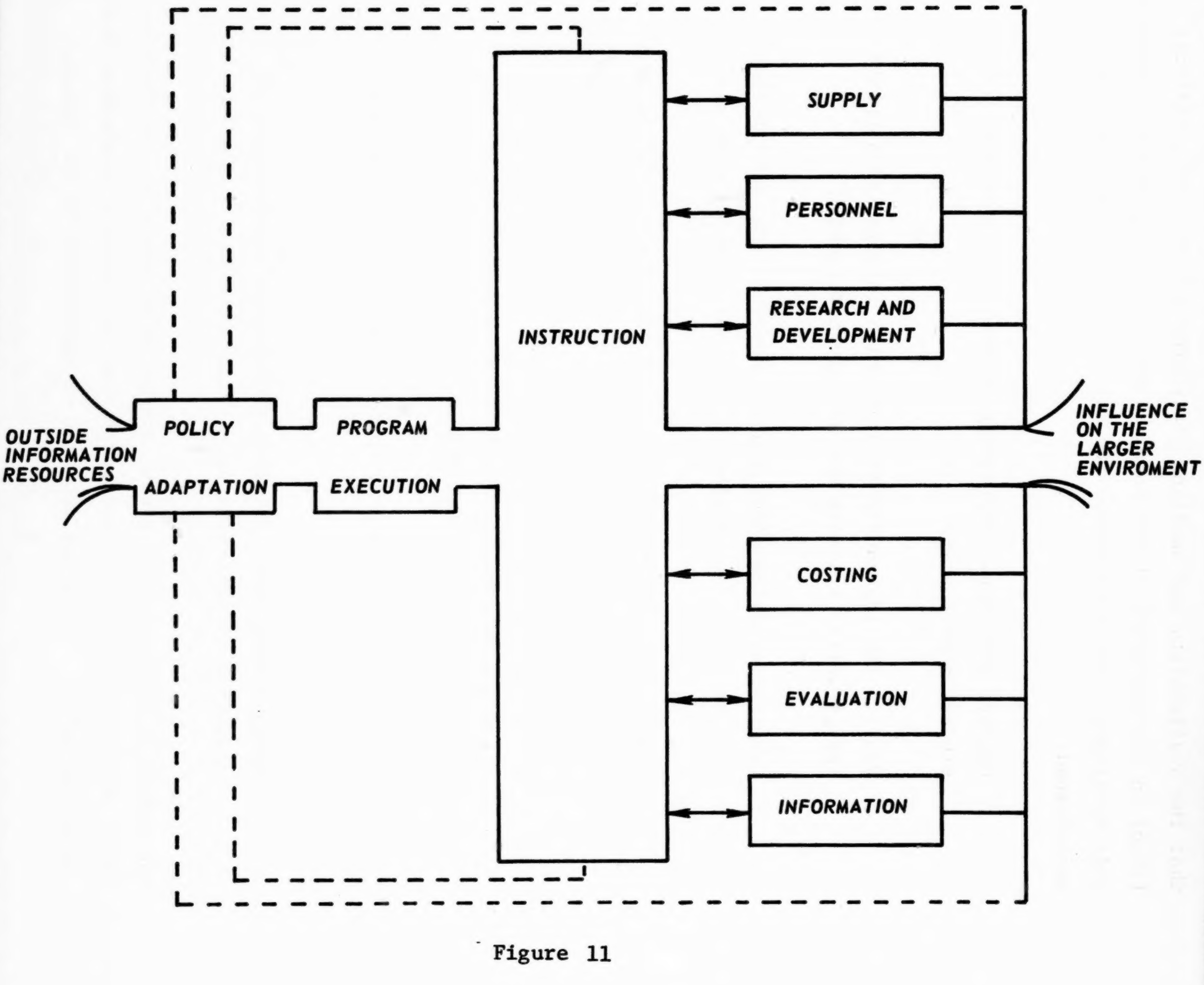

SUPPLY
PERSONNEL
RESEARCH AND DEVELOPMENT
INSTRUCTION
POLICY
PROGRAM
OUTSIDE INFORMATION RESOURCES
ADAPTATION
EXECUTION
INFLUENCE ON THE LARGER ENVIROMENT
COSTING
EVALUATION
INFORMATION

Figure 11

that the availability and handling of information will be a critical factor in the operation of the model, especially as instruction becomes individualized. For this reason the following guidelines have been established:

- Collect and store information on student performance and student expectancies.
- Provide the instructional staff with information displays that identify students who are having trouble.
- Order information about student needs so that instructional personnel can devote time to the most pressing problems.
- Develop a real-time information system for scheduling resources on a day-to-day basis so that they can be used in the most efficient manner.
- Store and compile instructional system data for program effectiveness, appropriateness, and impact.
- Combine information on student selection and retention characteristics.
- Compile data about existing and planned acquisitions of resources to determine short- and long-range needs.

Two models of information systems, one prepared specifically for Com-Field, the other presenting an operational information management system for a city school system are included as appendixes to the report.

The evaluation function also requires comment. The ComField evaluation system must possess three characteristics: (1) the capability for making observations of the total program's operations and outcomes, (2) the capability for appraising these observations in terms of a given set of standards, and (3) the means for providing evaluation outputs. The evaluation function will serve to permit decisions about the program's effectiveness in achieving its purposes, the validity of these purposes, and the impact of the program in school districts. Evaluation is seen in terms of a spiral; no single measure or judgment can effectively stand alone.

Since the ComField program is designed to be adaptable, it must possess the means for being responsive both to emerging problems and changing needs. Toward this end at least four kinds of evaluative data are needed:

- The appropriateness of the pupil outcomes identified as guides in determining the program for prospective teachers. (Are the ultimate objectives of the program the correct ones?)

- The effectiveness of teachers who have particular sensitivities and capabilities in bringing about the outcomes desired in pupils. (Are the selected sensitivities and capabilities the correct ones needed to bring about given outcomes in pupils?)

- The effectiveness of instructional systems for developing the sensitivities and capabilities for which they were designed. (Are the procedures used in the teacher education program effective?)

- The impact of the teacher education program beyond its immediate influence on teachers and pupils. (Is the school or larger social system changed as a result of the program?)

Special Features

The ComField model will make severe demands on any institution contemplating its adoption. Four factors are seen as critical in this respect: (1) a commitment to the development of such a program, (2) the availability of the kinds of resources needed to implement it, (3) the ability to create and live within the management structures required for its function, and (4) the availability of time to get it started. There are, however, trade-offs from the present program, so the task of implementation should not be considered insurmountable. New tasks for present faculty and new kinds of faculty are envisioned, and, while the model does not indicate how to train or to procure staff, it does point out that the foundations systems and laboratory phase are designed to free the college instructional staff from their traditional role of information givers, and as such will permit them to direct their energies elsewhere. Persons involved in the program will be required to enter a variety of new roles and relationships, and new skills will be required of faculty and staff. Undoubtedly, entry into such an arrangement will create anxiety. Prior attention to broad-based commitment and support can ease this problem, presuming the people and the institution are adaptable.

A MODEL OF TEACHER TRAINING FOR THE INDIVIDUALIZATION OF INSTRUCTION
BY THE UNIVERSITY OF PITTSBURGH

Overview

The general goal of the Pittsburgh Model of Elementary Education is individualized instruction for teachers-in-training, in-service teachers, and the pupils that will be served by these teachers. As defined by the Pittsburgh model, "Individualized Instruction consists of planning and conducting, with each pupil, programs of study and day-to-day lessons that are tailor-made to suit his learning requirements and his characteristics as a learner."

According to the model, individual pupils and groups of pupils can be appropriately taught using individualized instruction. Planning and conducting lessons need not be restricted to group activities, nor to tutorial instruction, nor to independent study. The same principles of individualized instruction should apply to teacher-training, including the preparing of new professionals and the self-development and renewal through in-service of present teachers.

Major Themes

The central theme of individualized instruction is interpreted in the model to mean that students are actively involved in the selection of learning experiences; that they make regular progress toward mastery, but at varying rates; that they use a variety of materials and facilities, often in laboratory settings; and that they evaluate their own performance.

The Pittsburgh model does not claim to be fully worked out, but represents instead an initial phase of program development. The model proposes a conceptual design, describes the program's goals, and indicates what its operation will be as fully developed in implementation phases. Its chapters provide outlines rather than detailed plans and materials for immediate application. Appendixes provide examples of more complete instructional modules and some estimates of costs for development of specific materials and operational procedures, with the indication that the major thrust of this work will take place in later phases of a research and development effort.

Instructional Goals

One assumption of the Pittsburgh Model is that United States school systems are faced with the problems of overcoming obsolescence of some teaching skills at the same time they are meeting requirements of daily operations and in-service education. The model program's goals are to train teachers--whether they are seeking initial or continuing education--to operate effectively in this setting. At the completion of training, teachers will be able to guide their own future growth. They will meet their learning goals before moving on to another set of goals, and they will operate skillfully in group situations, continuously contributing to their own self-development and that of others.

The model will attempt to train teachers through development of affective, cognitive, and field experiences, especially through emphasizing the humanistic aspects of education. As a first step, students as individuals will be allowed freedom to design parts of their program of study. A second step will be to re-design foundation courses in the liberal arts, bringing them up-to-date in accord with today's world and needs. A third step is to individualize instruction of elementary school teacher-trainees, who in turn will individualize the instruction of their pupils. Individualization will extend beyond the learning of concepts and skills into the learning of competencies in self-direction, inquiry, and personal-social characteristics.

Overall Program Organization

The model will apply to both pre-service and in-service education. In some respects the proposed model is similar to other existing plans of teacher education, particularly those involving the study of liberal arts. However, the organization of courses, the role of the teacher-trainee, and the emphasis on flexibility for meeting individual needs represent departures from the typical curriculum.

A first distinctive feature is that the Pittsburgh teacher education program is not course oriented. Instead, it is divided into five major components: academic knowledge, professional knowledge, guidance, clinical experiences, and teacher competencies. Each of the first four draws in varying degrees upon cognitive, affective, and field experiences and contributes to the fifth major component, teacher competencies. Figure 12 shows areas of objectives included in these components. Instead of courses, the student's program is divided into experience units. The authors define these units as modules of learning and instruction required for achieving a degree of mastery in an important competency area.

Second, the role of the teacher-trainee in the program is one of group cooperation and guided self-direction, in addition to following a prescribed sequence. In groups the student can receive and provide peer tutoring, receive feedback on his performance, and take part in the advisement of others. Thus he develops leadership and group cooperation skills needed in teaching. The trainee also is a partner with faculty advisors in determining his movement through the college program. From the very beginning, when the candidate's potential and the nature of his attitudes and commitment to education are judged by staff members before admission, student-faculty interaction is important to decision-making. This interaction continues as the student selects courses (or learning units) at four different stages of his academic career leading to the B.A. degree. Guided by an advisor, he selects and orders units on the basis of long or short term objectives, performances in previous units, and factors such as facilities available at school and requirements laid down by the authorities.

MAJOR COMPONENTS IN THE UNIVERSITY OF PITTSBURGH TEACHER TRAINING PROGRAM

Component	Areas for Specification
1. Academic Education	a. Humanities
	b. Social Sciences
	c. Natural Sciences
2. Professional Education	a. Learning theories
	b. Child development
	c. Psychology
	d. Decision-making and change
3. Guidance	a. Self development and evaluation
	b. Individual counseling
	c. Team work
4. Clinical Setting	a. Application of cognitive input and affective experiences.
	b. Refinement of education skills
	c. Study of the learning process
5. Competencies	a. Specifying learning goals
	b. Assessing pupil achievement of learning goals
	c. Diagnosing learner characteristics
	d. Planning learning programs with pupils
	e. Guiding pupils with their learning tasks
	f. Directing pupil behavior
	g. Evaluating learner progress

Figure 12

A third distinctive feature of overall program organization is its flexibility for meeting individual needs. Admission and exit of trainees are allowed at several points along the training continuum, according to demonstrated mastery of academic and clinical experiences. Once the trainee has entered, he follows the steps diagrammed in Figure 13. A general program pretest and diagnosis of skills and characteristics provide input for long-term program planning by the student and his advisor. He then takes a specific unit pretest to guide short-term planning. If he reaches criterion on the pretest, he skips that unit and goes to another; or, if he does not reach criterion, pretest results are used to select appropriate learning experiences. After taking alternative routes, he is posttested. Results lead either to remedial training and another posttest, to pretesting for a new unit, or to general evaluation for a new long-range plan if all units in this sequence are mastered. This scheme of pretests and postests provides a capability leading to an individually controlled entry and exit pattern.

The Pittsburgh model envisions a model sequence explicitly appropriate for all students in teacher training. A student moves through four stages as shown in Figure 14. The first and second stages correspond to the first two years of college education, prior to full admission into teacher training. The third and fourth stages allow the student to complete the requirements for a B.A. degree.

Figure 15 presents the total sequential movement of a teacher trainee through the four stages of the model, terminating with the B.A. in Education Degree after the completion of 32 learning units. The academic learning sequences offer the teacher trainee a continuous content resource in Liberal Arts, Behavioral Sciences, and Social Sciences. With his advisor the trainee will select learning units in academic disciplines by personal assessment, placement tests, and needs discovered by content tasks.

UNIVERSITY OF PITTSBURGH

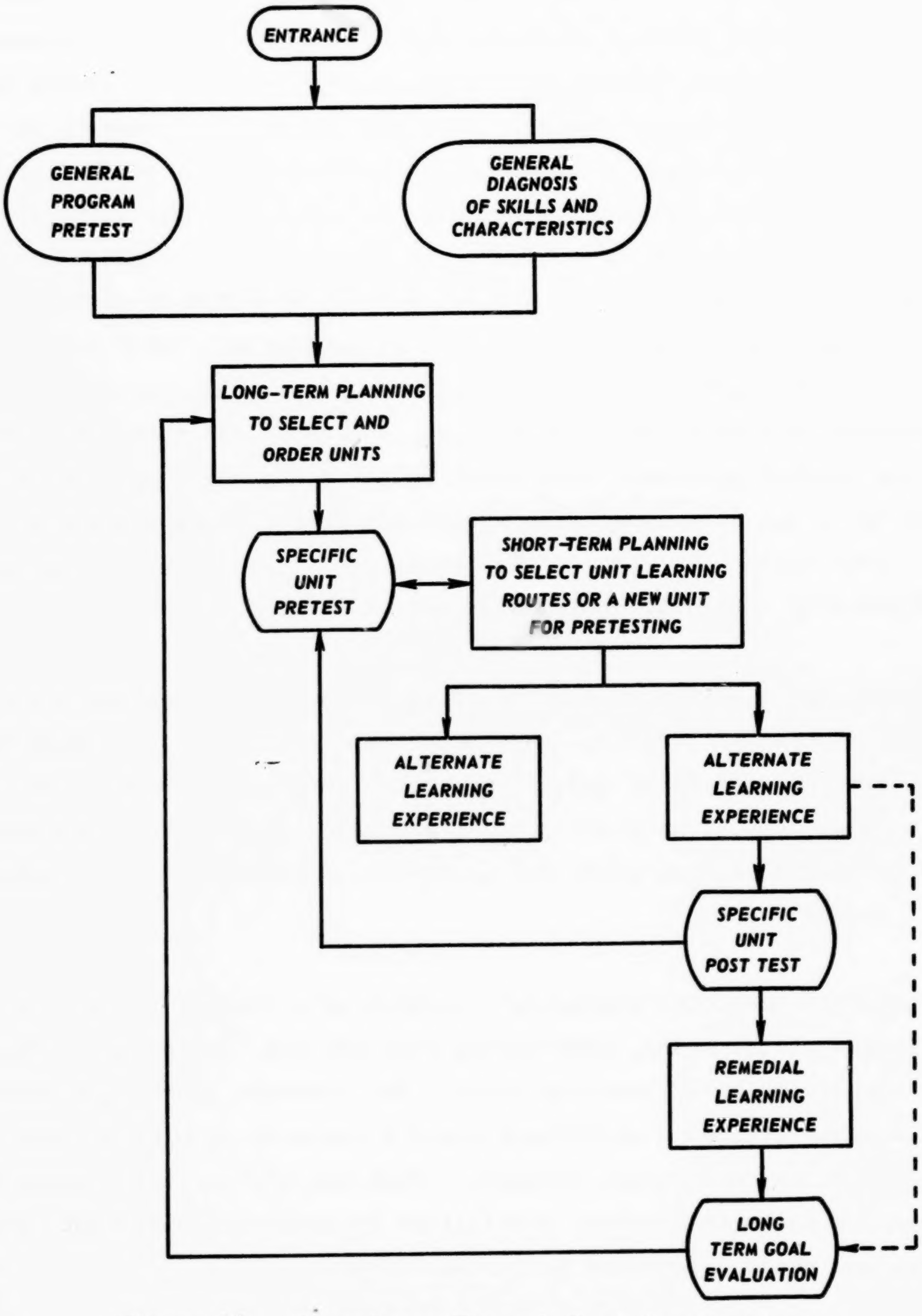

ENTRANCE
GENERAL PROGRAM PRETEST
GENERAL DIAGNOSIS OF SKILLS AND CHARACTERISTICS
LONG-TERM PLANNING TO SELECT AND ORDER UNITS
SPECIFIC UNIT PRETEST
SHORT-TERM PLANNING TO SELECT UNIT LEARNING ROUTES OR A NEW UNIT FOR PRETESTING
ALTERNATE LEARNING EXPERIENCE
ALTERNATE LEARNING EXPERIENCE
SPECIFIC UNIT POST TEST
REMEDIAL LEARNING EXPERIENCE
LONG TERM GOAL EVALUATION

Figure 13. Procedures Through Training Continuum

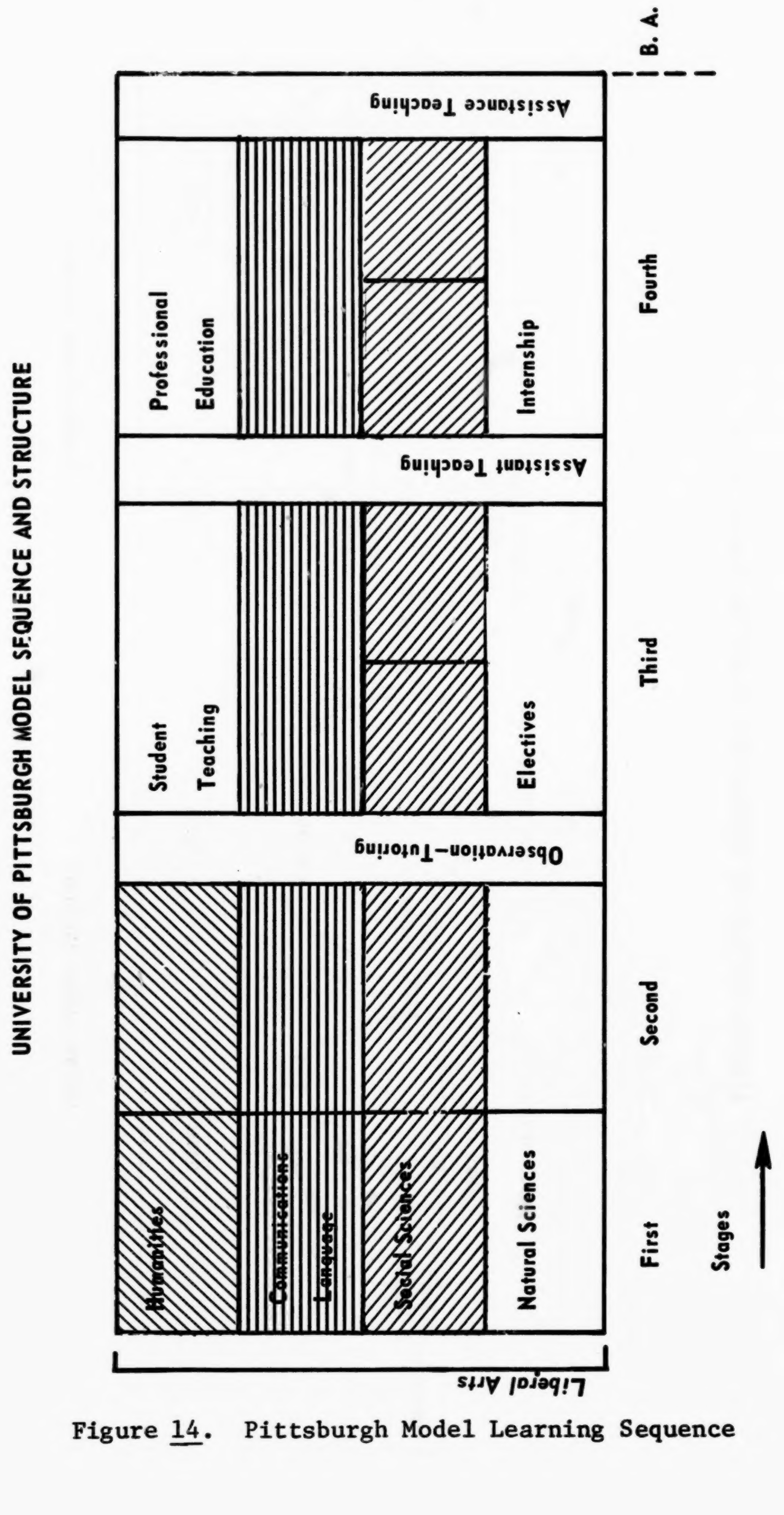

UNIVERSITY OF PITTSBURGH MODEL SEQUENCE AND STRUCTURE
Humanities
Communications
Language
Social Sciences
Natural Sciences
Observation—Tutoring
Student
Teaching
Electives
Assistant Teaching
Professional
Education
Internship
Assistance Teaching
B. A.
First
Second
Third
Fourth
Stages
Liberal Arts

Figure 14. Pittsburgh Model Learning Sequence

LEARNING SEQUENCES FOR INDIVIDUALIZED INSTRUCTION (Hypothetical Plan)

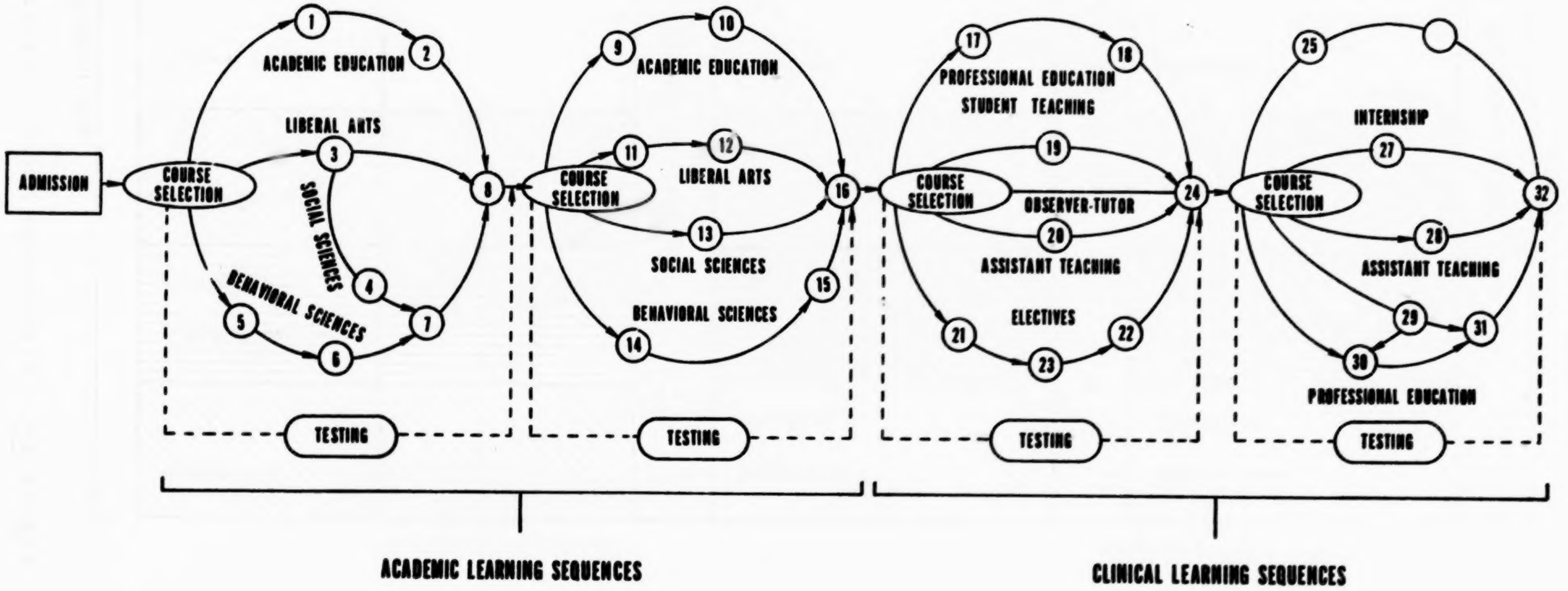

ADMISSION
COURSE SELECTION
1
2
ACADEMIC EDUCATION
LIBERAL ARTS
3
SOCIAL SCIENCES
4
BEHAVIORAL SCIENCES
5
6
7
8
COURSE SELECTION
9
10
ACADEMIC EDUCATION
11
12
LIBERAL ARTS
13
SOCIAL SCIENCES
14
15
BEHAVIORAL SCIENCES
16
COURSE SELECTION
17
18
PROFESSIONAL EDUCATION
STUDENT TEACHING
19
OBSERVER-TUTOR
20
ASSISTANT TEACHING
ELECTIVES
21
22
23
24
COURSE SELECTION
25
INTERNSHIP
27
28
ASSISTANT TEACHING
29
30
31
PROFESSIONAL EDUCATION
32
TESTING
TESTING
TESTING
TESTING
ACADEMIC LEARNING SEQUENCES
CLINICAL LEARNING SEQUENCES

Figure 15

In the clinical learning sequences, the trainee will observe and participate in the activities of the clinical setting. Data will be collected about his attitude, interrelationships, and successes as a tutor. Behavioral data and faculty judgment will form a part of the new basis for full admission into the training program.

Curriculum Design

The model specifies behavioral objectives in five curriculum areas called components. These components, briefly outlined above in Figure12, are Academic Knowledge, Professional Education, Teacher Competencies, Guidance, and Clinical Settings. In the following paragraphs, sample objectives for the various components and their major subdivisions are presented. Total numbers of associated objectives are also listed.

Academic Knowledge Component (28 objectives)

a. Liberal Arts in the Elementary Curriculum (8 objectives)

EXAMPLE:

Grasp of major modes of inquiry employed in gaining and applying knowledge.

b. Behavioral Sciences in the Elementary Curriculum (11 objectives)

EXAMPLE:

Knowledge of the sources and resolution of prejudices.

c. Social Sciences in the Elementary Curriculum (9 objectives)

EXAMPLE:

Conceptual grasp of the major types of learning goals and knowledge of how they are represented in elementary school curricula.

Professional Education Component (2 objectives)

a. Clarify, explain, and conceptualize the decision-making process employed in teaching.

b. Establish a system for modifying the decision-making process in such a way as to incorporate knowledge about human learning.

Teacher Competencies (119 objectives)

a. Specifying learning goals (15 objectives)

EXAMPLE:

Ability to identify learning objectives of each type, either independently of any one curricular area, or within a given curricular area.

b. Assessing pupil achievement of learning goals (8 objectives)

EXAMPLE:

Competency to use rating methods, observational methods, interview methods, and situational tests in evaluating pupils' accomplishment of these types of learning goals: inquiry, self-direction, interests and motives, self-analysis and self-evaluation, personal development, cooperative behaviors, and group process.

c. Diagnosing learner characteristics (18 objectives)

EXAMPLE:

Ability to report a pupil's general intellectual functioning as it is observed in a variety of learning activities.

d. Planning long-term and short-term learning programs with pupils (12 objectives)

EXAMPLE:

Ability to integrate, with a pupil, data on overall achievements and learner characteristics into a long-term program, spelling out emphases to be placed on different types of learning goals and on work within different curricular areas.

e. Guiding pupils in their learning tasks (16 objectives)

EXAMPLE:

Ability to provide alternative activities for those pupils who complete learning tasks without difficulties.

f. Directing pupil behavior (11 objectives)

EXAMPLE:

Ability to initiate case studies when behavior problems continually obstruct learning task completion.

g. Evaluating the learner (5 objectives)

EXAMPLE:

Ability to administer, score, and interpret an appropriate pretest for determining a pupil's next learning task within a curricular area.

h. Participating in teamwork with colleagues (14 objectives)

EXAMPLE:

Knowledge of differentiated roles present in school instructional teams.

i. Enhancing development (20 objectives)

EXAMPLE:

Ability to analyze one's own strengths and weaknesses as related to professional behavior.

Guidance Component (15 objectives)

EXAMPLE:

Ability to formulate plans for self-development

Clinical Settings Component (8 objectives)

EXAMPLE:

Ability to participate in research endeavors serving teacher education.

Institutional Relationships

The authors of the Pittsburgh Model stress the importance of at least four linkages to support their program. First, there must be commitment and cooperation among the faculty groups within the School of Education. They must be able to work together to establish the competencies required for individualizing instruction, to see what experiences contribute to those competencies, and to restructure courses into learning experiences that are completely relevant. Second, there must be a linkage with the liberal arts faculty in order to reform foundation courses for pertinence to today's world and needs.

A third important linkage is with research agencies or development centers. The research-oriented faculty and the operations-oriented faculty should strive to establish a common vocabulary, mutual respect, and compatible approaches to problems. Only through this cooperation can the model gain needed support in careful specifications of learning goals and in systematic evaluation of model components.

The fourth linkage is with public school districts cooperating in the establishment of clinical settings for training. A coalition should be formed that involves school districts, the University, teacher organizations, and Federal and State agencies. The school districts will serve children, develop staff, and provide materials and equipment. The University provides a model of teacher education, trains staff, and evaluates and revises instruction. Teacher organizations evaluate present instructional modes and develop policies. Federal and state agencies assist local and regional efforts to implement individualized instruction.

Innovative Features

The University of Pittsburgh teacher education program includes the following innovations:

- Emphasis on individualized procedures for teacher training.
- Use of student groups to provide peer help and feedback.
- Establishment of a coalition of agencies to furnish clinical settings for pre-service and in-service training.

Student Guidance

A system of guidance is developed within the Pittsburgh model providing information for processing applicants, for admission procedures, for counseling-out, and for review and synthesis. Guidance of teacher-trainees is only in part a faculty responsibility. Generally, the emphasis is upon self-direction, especially in those skill and knowledge areas involving career-development, personal attitudes, and program orientation.

Admission into the program includes the assignment of an advisor to the student. During the first two years, or academic sequence, the trainee works with his advisor to select experience units in the liberal arts. His selection is a result of personal assessment and placement tests, or a result of needs discovered in his work with children and in content tasks. The last two years are involved with a clinical sequence of three phases: 1) Observor-tutor, 2) Student Teaching and Assistant Teaching, and 3) Internship and Assistant Teaching in association with cognitive education. Student learning groups are essential to the clinical experiences since they provide peer support, feedback, and many mechanical details of advisement. The advisor consults with the learning groups, lending assistance to the students in developing skills to enhance team activity. A large portion of the advisor's attention will be directed to the operation of the learning group; however, individual guidance will also be supplied as the need arises. The help of the advisor will be required in determining when specified degrees of mastery are achieved in each clinical phase and when the student is ready to be scheduled into new experiences.

Management and Control

The structure of the model includes a General Training Plan of Personal and Professional Development. This plan implies a new form of teacher-training management. For teacher training to move to a competency base will mean elimination of the accumulation of course credits, grades, and hours within rigid semester organizational patterns. The successful application of knowledge with pupils in accepted instructional modes, in the judgment of clinical faculty, will be the criterion for certification.

The college instructor of liberal arts will permit the trainee to pretest and posttest unit experiences at his own pace. Tests in this case will be more than paper and pencil in nature. A competency requires the ability to know, understand, and demonstrate a specific task at or above an identified level of performance.

Evaluation of the teacher-training model is required in order to provide information for program improvement. Assessment of both formative and summative evaluations will be relevant. Implemented programs will include reviews of behavioral objectives, validity studies, tests and measurements, and staff training. Program assessment includes data and measures concerning trainee performance, instructional materials, and classroom procedures, as well as follow-up studies of program graduates.

Special Features

The Pittsburgh Model includes the development of a functional budget approach based on probable costs of operational units. The discussion is intended to supply a prospective user with information necessary to develop a budget appropriate for his local situation. Five major cost sources are identified: Administration and Coordination, Instructional Materials Development, Retraining Faculty, Space, and Evaluation. All five are expected to have high initial costs which will later taper off to maintenance levels. Cost factors are presented, but it is pointed out that they have not been validated and are subject to an uncertain degree of error. The Pittsburgh authors suggest that it would be appropriate to make proper allowance for exchange of funds among functional units and to make reasonable provision for contingencies.

Administration and Coordination. For administration and coordination, the Pittsburgh model anticipates that one added professional person for every 50 students will be needed for the first two years, and one for every 100 students thereafter. The cost for one such person, including salary and benefits, space, facilities, secretarial support and travel is estimated at $30,000.00 per year.

Instructional Materials Development. Many specialized materials will be needed to implement individualization. It is estimated that perhaps 20% of these can be bought and used almost "as is." Another 70% might be adapted from commercial texts, films and other material, using programmers and unit writers to do the modification. The remaining 10% would need to be independently designed and created.

Experience has shown a cost of $3,000 per clock hour to create individualized materials for elementary school instruction. Assuming that figure applies also for higher education, that modification and adaptation of commercial materials for individualization will cost approximately $500 per clock hour of instruction, that "as is" material will need initial implementation to the extent of $100 per instructional clock hour, and that approximately 1,800 clock hours of instruction make up a four-year collegiate program. The following costs are estimated for the Pittsburgh model:

Amount and Type of Material	Instructional Hours		Development Cost Per Hour		Cost Estimates
20% (as is)	240	x	$ 100.00	=	$ 24,000.00
70% (adapted)	840	x	500.00	=	420,000.00
10% (created)	120	x	3,000.00	=	360,000.00
TOTAL					$804,000.00

When all the individualized instructional materials are available for use, a cost of $40.00 per instructional hour is further estimated to maintain and replace materials as needed.

Retraining Faculty. Costs for released time and the tutelage of faculty in the use of individualized instruction are estimated to involve an average of 20 hours of individualized instruction and supervision per college faculty member. The cost per hour per faculty member is estimated at $50.00, including released time, personnel, and materials, or $1,000.00 per faculty member for the initial 20 hours.

Space. Estimating the space increase needed on a per student basis as 50 square feet to accommodate carrels, laboratories, and other essential requirements, and calculating the space footage cost at $5.00 per year, the per student cost would be $250.00 per year over and above present costs.

Evaluation. The model notes that budgeting for evaluation is necessary, but makes no specific estimates.

SPECIFICATIONS FOR A COMPREHENSIVE UNDERGRADUATE AND IN-SERVICE TEACHER EDUCATION PROGRAM FOR ELEMENTARY TEACHERS BY SYRACUSE UNIVERSITY

Overview

The Syracuse University model features an open and pluralistic emphasis. Readiness to adapt to change and acceptance of individual differences characterize both the model's instructional program and the ideal teacher to be produced. Sensitivity to varying needs is stressed, along with systematic planning and careful evaluation of progress. The model also specifies many particular skills and understandings, each of which is addressed by a separate instructional module with its own objectives and procedures. Student experiences in teaching at progressively more difficult levels are essential, culminating during the program's fifth year in placement in a paid work-study teaching position. In order to ensure fruitful relationships with elementary schools as well as with the developers of supporting educational materials and services, the model proposes cooperative sponsorship and control rather than control by the teacher training institution alone. Students also participate in decision-making affecting the program.

Major Themes

The model's view of the future is that it is changing and uncertain. It follows, therefore, that teachers, pupils, and educational programs must be adaptable and self-renewing.

The model's view of the school includes no commitment to any particular organization, curriculum, or set of techniques. Instead, commitments are at a higher level of generality. What is important is that schools should be open and pluralistic, and that they should recognize and develop individual differences and individual responsibility. Schools should be involved actively in teacher education, both pre-service and in-service.

Generally, teacher education is viewed as a life-giving process, involving creative interaction with a complex environment. The entire model adopts a system approach in which a repeated intent - action - feedback (plan - execute - evaluate) cycle is basic. The approach emphasizes:

- Subordination of techniques to goals.
- Overall program management, including cooperation with schools and with designers and developers of educational materials and facilities (industry, research and development laboratories, etc.).
- Concern both for program development and program operation.
- Concern for students (individually and in groups) as key elements in program operation.
- Provision of alternative paths and progress rates.

Instructional Goals

The teachers produced by the model program should behave in ways that maximize the learning of their pupils. They should be able to see new fields and new worlds, adapt to change, and be partners in change. They should be self-renewing and in part self-directed. The program helps individuals to become increasingly perceptive, to have a positive concept of themselves as teachers, to come to terms with themselves in respect to their motives for becoming teachers, and to develop a system of professional values consistent with their personal integrity and the demands of the education profession.

More specific goals of the program's separate components are:

- to transcend ignorance and limiting specialization (Liberal Education Component).

- to be skilled in problem resolution (Methods and Curriculum Component).
- to be sensitive to and aware of children and to understand the meaning of children's behavior (Child Development Component).
- to make wise teaching decisions (Teaching Theory and Practice).
- to be aware of one's self as a person, as a teacher, and as a professional (Professional Sensitivity Training).
- to understand the social and cultural dynamics of the classroom and the school as a social institution (Social-Cultural Foundations).
- to be professionally independent and responsible (Self-Directed Component).

No admission requirements are specified; admission will depend on the student's interest and on negotiations with advisors. The Liberal Education component acts in part as a selection center for potential teacher education candidates. The program's information and evaluation support system provides a background to assist decisions.

Overall Program Organization

The program is presented as structured into five years. (See Figure 16.) Liberal studies occupy the first two years and a portion of the third year. The remainder of the junior (pre-professional) year constitutes an introduction to teaching. Simulated teaching, tutoring, and micro teaching are included. Six professional components are introduced: Methods and Curriculum,

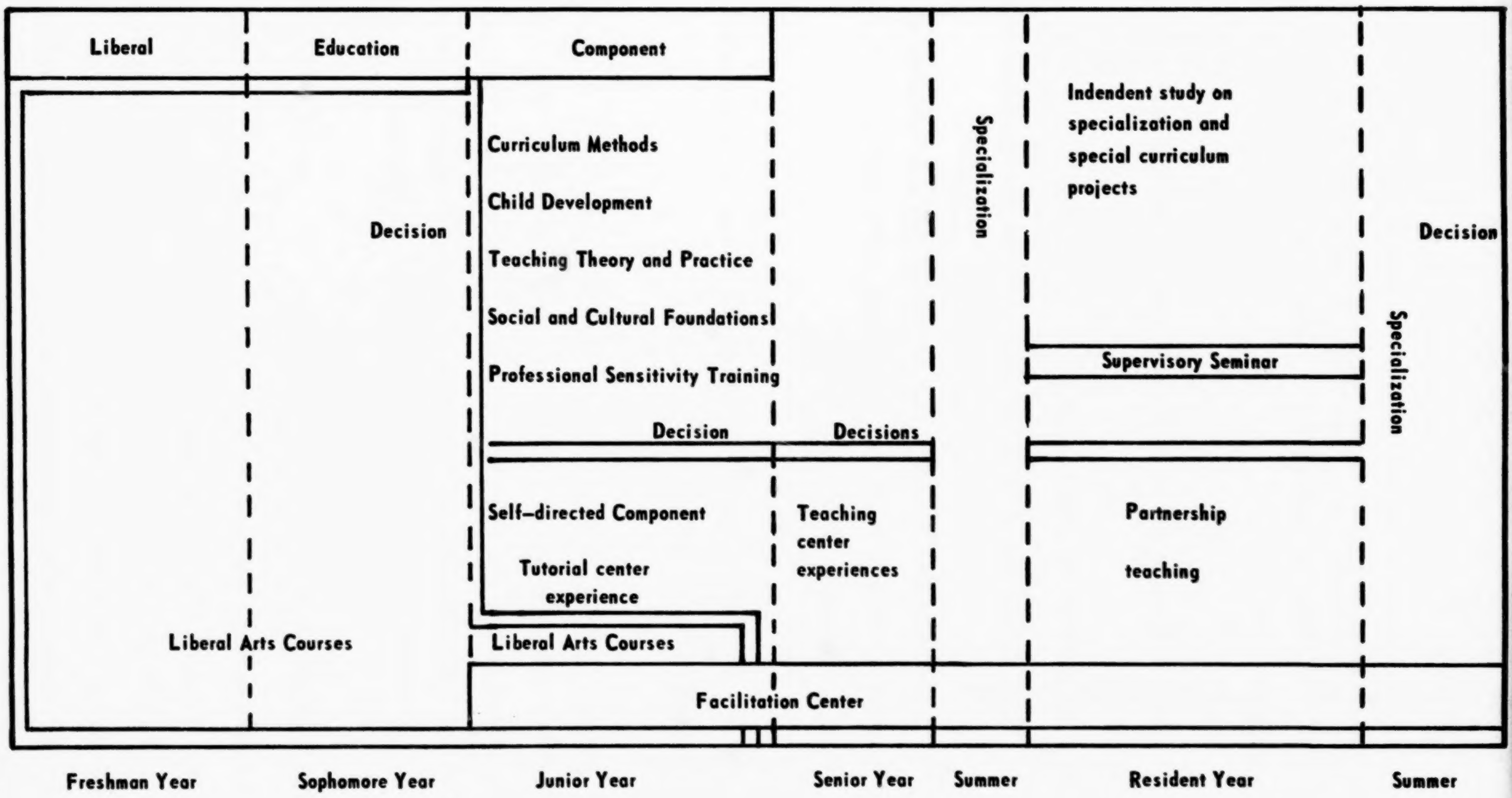

Liberal
Education
Component
Curriculum Methods
Child Development
Teaching Theory and Practice
Social and Cultural Foundations
Professional Sensitivity Training
Decision
Decision
Decisions
Self-directed Component
Tutorial center experience
Teaching center experiences
Liberal Arts Courses
Liberal Arts Courses
Facilitation Center
Specialization
Indendent study on specialization and special curriculum projects
Supervisory Seminar
Partnership teaching
Decision
Specialization
Freshman Year
Sophomore Year
Junior Year
Senior Year
Summer
Resident Year
Summer

Figure 16. Overview of the Five Years of the Syracuse Model Program

Child Development, Teaching Theory and Practice, Professional Sensitivity Training, Social and Cultural Foundations, and a Self-Directed Component.

The senior (professional) year is devoted to greater depth in the six components, to supervised planning, carrying out, and evaluating a series of teaching units, and to choice of a teaching specialization. The fifth year contains specialized study, as well as a full school year of half-time partnership teaching at a Resident Center in a cooperating school system.

In addition to these time-sequenced instructional components, the model contains three support systems. The Program Support System is concerned with the design, development, testing, improvement, and logistic maintenance of the instructional program. The Information and Evaluation Support System is concerned with control and modification of the program, with student progress, and with dissemination of information about the program to other institutions. The Organizational Support System is responsible for development of organizational structures and of personnel.

The model's in-service program is implied rather than specified. Students who have successfully completed the five-year program will be committed to their own continuing education, and the Information and Evaluation Support System will attempt to be aware of their problems and progress.

Curriculum Design

View of knowledge: A precise definition of knowledge is not given and would indeed violate the model's commitment to pluralism and openness. "Knowledge" is whatever the student gains from the program, as a result of successful completion of all components. In many cases it would be tested by means of module posttests, supplemented by instructor evaluation and by student self-evaluation. Knowledge of content and knowledge of techniques are both important. In addition, knowledge of self (in several dimensions) and sensitivity to others (pupils, colleagues, etc.) are critical. In these areas, knowledge-for-labeling is far less important than knowledge-for-acceptance and knowledge-for-cooperation (to work toward educational goals).

The program has seven instructional components (liberal studies plus six professional components). In most cases, the components are organized into specifically delineated instructional modules. The seven are:

Liberal Education Component. This component consists of three one-year courses (six semester hours each): Humanities, Social Sciences, Natural Sciences. One could be taken in each of the first three years of the model program. (The remainder of the first two years would be devoted to the basic liberal arts requirements of the adopting college or university and those content requirements necessary for state certification.) The three courses are specially designed to unite liberal education and teacher education and to act as a selection center for potential teacher education candidates. The component is directed by a policy board representing both the College of Education and the College of Liberal Arts. Advisement is an important function of the component.

Methods and Curriculum Component. For this component, a problem resolution model for teaching is basic, containing four phases--diagnosis, input, synthesis, and output. The component has 21 instructional modules organized into five groups:

- Curriculum content. Modules in English, science, mathematics, and social sciences are handled by self-instruction from programmed sources. They are scheduled for early in the junior year.

- Teacher description of school events. Detailed sequences of group and individual activities and evaluations are specified, to be accomplished early in the junior year.

- Beginning teaching phase. These junior year modules include tutorial and micro-teaching experiences.

- Advanced teaching phase. Teaching in school centers is an aspect of the senior year.

- Curriculum planning. Both practice and theory of planning are offered in the senior year.

Child Development Component. Four of this component's 13 modules are scheduled for the junior year and the remainder for the senior year. The modules include:

- Skills of Making Open Observations
- Using Open Observations
- Skills of Making Closed Observations
- Using Observations in Structured Situations
- Resources for Child Development Inquiry
- Theory and Empirical Investigation in Child Development
- Reinforcement Theory
- Phenomenological Theory

- Cognitive Theory--Piaget
- Psychoanalytic Theory
- Longitudinal Studies

The component's central focus is given to actively involving the student in describing and analyzing child behavior, so that he becomes cognizant of many behavior dimensions and can consider alternative meanings of behavior.

Teaching Theory and Practice Component. This component focuses on teaching as a decision-making process. Searching for alternatives is emphasized, as well as extrapolating plans and weighing alternative outcomes. Nine of the component's 16 modules are scheduled for the junior year, the remainder for the senior year. The modules deal with teaching behavior, educational objectives, teaching strategies, statistics and research, and management of student and classroom behavior.

Professional Sensitivity Training Component. This component is concerned with the development of the student's understanding and skills in the dynamics of intrapersonal, interpersonal, group, and organizational interactions relevant to teaching. Its prescriptions are based in part on untested assumptions which will be tested as the model is implemented. The component is primarily pre-professional, six of its seven modules occurring during the junior year. The modules include T-group training; the classroom group as a social system; classroom emotions; teacher values and pupil norms; teacher role, behavior, and style; teacher-pupil interaction; and increasing awareness of self as a member of the educational system.

Social-Cultural Foundations Component. This component draws most heavily from sociology and philosophy. It is also concerned with applications to education from anthropology, political science, and economics. The component's 21 modules are organized into five groups:

- Pre-Professional Year. Social, Cultural, and Organizational Determinants of Behavior in Schools.
- Senior Year. Language, Logic, and the Teacher.
- Senior Year. The School and the Teacher.
- Resident Year. Analyzing the Language and Logic of Instruction.
- Resident Year. Education and Social Problems.

The Self-Directed Component. This component is not modular. It emphasizes the development of each student's professional individuality through exploring values, assuming responsibility for one's own learning, and pursuing specialized training toward individually chosen goals. Its features include:

- A counseling-advisor, picked by the student. Students are encouraged to meet with their counseling-advisors at least once every three weeks.
- Student-controlled "enabling seminars," containing about 12 students each, which meet once a week. "Faculty facilitators" may be invited.
- A student-controlled weekly newsletter.

- A "Planning and Goals Paper" written in two versions--at the beginning of the junior year and the end of the senior year.

A facilitation center is specified in order to provide space, personnel, and resources for the Self-Directed Component (as well as for aspects of other components). It will have a resources center making available books, films, tapes, and so forth; a production center for educational materials and the student newsletter; and an appropriate staff of advisors and support personnel.

"Learning experiences." The program's modules are built on selections from many types of both individual and group activities. Independent activities include reading, writing, experiencing stimulus materials, engaging in simulations, in field participation, and in field observation. Group activities may involve seminars up to 16 students or smaller groups down to 2 participants. Scheduled lectures are not included except in the Liberal Education Component.

The program's learning experiences are extremely varied. Intellectually, they range from simple to complex and from passive to active. Affectively, they range from neutral to direct emotional involvement. Work is included with problem packets, films and tapes, self-constructed audio and video tapes, programmed instruction, role playing, case studies, semi-programmed materials, remedial materials, pretests and posttests, reference materials, field observation and trials, self and group criticism, study guides, simulated setting, discussions, arguments, written analyses and exploration, and so on. Specified instructional modules combine activities of the preceding types in a recommended order.

Institutional Relationships

The program is inherently multi-organizational, depending for its development and operation on the cooperation of a teacher education institution with one or more school districts and with instructional materials development agencies from industry and elsewhere. The program might operate initially under the auspices of a School of Education within a college or university, but a high degree of autonomy is expected. Eventually the multi-organizational cooperative would take over. The participating organizations would provide staff and facilities according to their special abilities. The college or university would supply some but not all faculty members. Local school districts would be heavily involved, making it possible for students to observe and teach in actual schools during their junior, senior, and resident years. Selected teachers in these schools would serve as supervisors of student activities. In addition, industry and educational laboratories would cooperate to develop methods and materials.

Innovative Features

The Syracuse model does not emphasize to any great extent a special group of innovative features. It includes, as a matter of course, numerous current innovations, but these are subordinated to overall goals to be met. Innovations are to be experimented with, used when beneficial, and superseded when better techniques can be discovered.

One of the model's major innovations is the multi-organizational cooperative established for managing overall development and operation. Systematic planning and evaluation are emphasized. A somewhat novel feature is the inclusion of Professional Sensitivity Training as one of the model's seven instructional components. This component's major task is to increase the student's awareness of and sensitivity to the interpersonal dimensions of the learning situation. It is an important part of the student's junior year, and includes T-group training, as well as seminars, and tests focusing on classroom emotions, teacher values, style, pupil norms, teacher-pupil interaction, and awareness of self.

Other innovative experiences include simulations, tutoring individual children, micro-teaching, and paired teaching in paid work-study positions. Throughout the model, teaching is presented as a decision-making process which requires searching for alternatives and weighing alternative outcomes. Most of the latest developments in educational technology (except for computer-assisted instruction and scheduled TV lectures*) are relied upon.

Personal Growth and Guidance. A key program goal is personal growth--students are to become continually self-renewing persons and teachers. Two components of the program are especially concerned with this goal--the Professional Sensitivity Training component and the Self-Directed component.

In addition to guidance furnished in connection with these two components, the Liberal Education Component provides advisement related to program entrance and scheduling, and the Information and Evaluation Support System furnishes data on student progress and problems. Self-evaluation, test data, and instructor evaluation will all be used, and congruence will be hoped for.

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*Videotaped lectures are available for individual or group study, but there is no use of pre-scheduled broadcast or closed circuit TV lectures.

Management and Control

The program is planned for continuous improvement through a built-in intent-action-feedback (plan-execute-evaluate) process. Three support systems are called for:

- Program Support System. This concerns itself with planning instructional systems and providing, evaluating, and maintaining materials.

- Information and Evaluation Support System. An evolutionary, flexible and practical instructional management system is desired--probably computer-based. Formative (developmental) evaluation is preferable to summative (certifying) evaluation. Pretest, process, and product evaluation are required; in many cases instruments will need to be developed.

- Organizational Support System. This system contains two substructures, concerned respectively with maintenance (focusing internally in order to maintain stability and predictability through internal communications, feedback loops, training, and organizational development), and with adaptation (focusing externally in order to assess the readiness for change of related external organizations, and create an effective change model).

The model provides very little in the way of detailed descriptions of these support systems. Team building is considered to be particularly important, and team-building conferences are recommended. Students are to be included as members of the team and are to be involved in decision-making--not just in decisions about themselves, but also in decisions affecting the development, evaluation, and modification of every aspect of the program.

An important management concept which is discussed several times involves the creation of a teacher education corporation, governed by a board of directors drawn from three types of institutions--(a) a university or college, (b) elementary and nursery schools, and (c) the educational industry and other agencies engaged in the development of curriculum and instructional materials. This corporation would manage and control the teacher education program in a responsible, effective manner. It would have a clear commitment to teacher education, it would provide organizational stability and a supportive environment for its commitment, and it would recognize and reward its staff members directly for their contributions to its goals (rather than for such peripherally related matters as research, writing, and graduate teaching).

Placement and Follow-up

The model's placement and follow-up program for its graduates is for the most part implied rather than specified, except for the fifth (residence) year. This year is spent in paired teaching in a cooperating school district; placement is arranged in connection with the program's counseling-advisor function. Placement after that would be a matter of opportunity and individual decision. Follow-up information would be fed back to the program.

The model suggests that its graduates may have a considerable effect on the schools they go to teach in through sponsoring "responsible revolutions."

Special Features

The model includes four special types of facilities.

- Tutorial and Micro-Teaching Center. This function is served by one or more public schools, staffed with a center director and a team of specially trained clinical teachers. The staff assists students during their junior year in establishing appropriate tutorial relationships with public school pupils. The clinical teachers are regular public school teachers with additional clinical-teacher skills and responsibilities.

- Teaching Center. Several teaching centers are contemplated, each in a live public school setting, differing in age levels (nursery school through intermediate grades) and in social and economic backgrounds. Each teaching center has a director, clinical professors (e.g., for measurement, for instructional materials, and for methods and curriculum), and clinical teachers. During the senior year, students are assigned in pairs for a portion of each day to a teaching center where they engage in a variety of exploratory teaching activities. Clinical professors and clinical teachers will be trained by going through instructional modules in much the same way as students.

- Resident Center School. The program calls for a diversity of Resident Centers at which students would teach during their fifth year. The student would be assigned to the Resident Center of his choice for an entire school year and would engage in responsible partnership teaching with another resident. The two residents would share an actual position, and each would be paid half a salary. The partnership teaching would be supervised by the Resident Center director and a staff of clinical professors. A problem seminar would be conducted but there would be no formal course work at the Center. Curriculum development projects would also be carried out at the center by teams including resident students, regular teachers assigned to the Center, clinical professors, and representatives of educational industry and laboratories. A Resident Center would be established in connection with an ongoing elementary school, to which 20 residents might be assigned for the year. The residents would be in contact with more experienced teachers who would work with them on special project teams, but who would not have direct supervisory responsibility for their activities. Facilitation Center resources (see below) would be made available at Resident Centers.

- Facilitation Center. An important feature of the Self-Directed Component is a Facilitation Center--a place for counseling-advisement, student newsletter production, enabling seminars, and instructional resources. The Facilitation Center library will house a large quantity of educational materials including audio and video tapes. The Center staff includes a director, counseling advisors, faculty facilitators (optional leaders of enabling seminars), T-group trainers, a field consultant (to arrange field experiences and summer training), a liaison man (between the enabling seminars and the Facilitation Center), a librarian, a production center supervisor (to provide production services to students for A-V materials and newsletters), and an abstractor-recorder (to record student progress, perhaps with computer assistance).

EDUCATIONAL SPECIFICATIONS FOR A COMPREHENSIVE ELEMENTARY TEACHER EDUCATION PROGRAM

BY THE UNIVERSITY OF TOLEDO

Overview

A consortium of the State Universities of Ohio, acting through the University of Toledo, has prepared a set of educational specifications for a comprehensive undergraduate and in-service teacher education program for elementary teachers. This cooperative endeavor was influenced by a concern that existing programs of teacher education have not been adequate for changing conditions in American schools. Traditions of teacher education tend to maintain the self-contained classroom concept of the school and the single image of the teacher. The pervasive impact of educational change, however, necessitates structural revisions, and new structures will require different kinds of teachers. To achieve these changes and innovations, the consortium has developed a model of teacher education based on the Research and Instruction organizational pattern and team teaching concept developed by the Wisconsin Research and Development Center for Cognitive Learning.

Major Themes

A succinct description of necessary educational changes has been provided by Dr. Don Davies, Associate Commissioner, Bureau of Educational Personnel Development, U. S. Office of Education, and includes:

- Moving from a mass approach to an individual approach in education.
- Moving from an emphasis on memorizing to an emphasis on learning how to think and how to learn, and to an emphasis on the non-cognitive, non-intellectual aspects of living.

- Moving from a concept of a school isolated from the community to a concept of a school that is in and of the community.
- Moving from a fear of technology to utilizing machinery and technology for educational purposes.
- Moving from a negative to a positive attitude toward children who are different.
- Moving from a provincial perspective of the world and education to a multi-cultural perspective.
- Moving from a system characterized by academic snobbery to one which recognizes and nurtures a wide variety of talents and fields.
- Moving from a system based on serving time to one which emphasizes performance.

With these changes in mind, the Ohio model adopted goals for the development of programs by surveying and evaluating previous and current attempts to establish goals for elementary schools and teacher education. Some of these goals include the Education Policies Commission Classification, and those of the Mid-Century Committee on Outcomes in Elementary Education. In addition, the goals outlined in 44 college and university catalogues were reviewed. From this review, it was determined that the goals statement of the Pennsylvania Committee on Quality Education would form an adequate basis for the model. This set of ten goals deals with teacher behaviors in the following areas:

- Self-understanding by children
- Cultural appreciation of human beings
- Basic mastery of words and numbers
- Positive school and learning attitudes
- Physical and emotional well-being

- Creativity in diverse fields
- Continuing educational opportunities
- Understanding and appreciation of liberal arts
- Living in a changing world

The processes and procedures that form the substance of the model were derived from these goals.

The development of five contexts of education and the providing of specifications for several different target populations of teacher or support groups are integral to the conceptual design of the Toledo model. Six selected subsets of the educational population are included as targets for the model, and detailed specifications are developed describing content and processes for each group.

- Pre-service: Preschool and Kindergarten Teachers
- Pre-Service: Elementary Teachers (1-8)
- In-Service Teachers (all levels)
- The Teachers of Teachers College and University
- Administrators (Principals and Supervisors)
- Supportive Personnel (Teacher Aides)

Instructional Goals

The overall guiding principle of the model program's development is that use of composite educational specifications should be applied to the development of specific programs for the education and continuing education of the six subsets or target populations of educational personnel. To provide flexible programs the model proposes composite specifications which may be directed toward the particular needs of an institutional environment, a region or some other determining requirement.

Some generalizations underlying the goals emphasized by the new framework for preparing elementary teachers may be discussed with respect to the selected target populations:

- Major instructional attention will be given the contexts of instructional organization and contemporary learning-teaching process.
- Both educational technology and societal factors will receive more attention than in traditional programs.
- There will be an emphasis on conducting and using research in the instructional setting.
- All treatments in the programs are activity-centered.
- Student involvement is divided between individual study and group or team experience.
- The model provides for a progressive involvement from observation through simulated activity to direct classroom experience.
- Conference, performance, and observation are types and means of evaluation.
- A variety of education media is implemented in practice with these programs.

Overall Program Organization

The Toledo model is organized about a catalogue of 818 educational specifications that include 1,411 behavioral objectives for elementary teacher education. The model contains a set of procedures for assembling the educational specifications into tailored educational programs for each of the target populations. The model possesses a generalized system for evaluating the effectiveness of the educational programs.

Educational Specifications. As previously described in this summary, the Ohio project staff reviewed statements of goals for elementary schools and teacher education, and agreed upon a list of ten. On that basis, educational specifications were prepared for the subsequent development of composite specifications for model programs. The educational specifications were developed through a four-step process:

(a) Review of Goals

(b) Development of Objectives

(c) Preparation of Objectives

(d) Organization of Specifications

Five distinct components form the basis for the conceptual design: goals, contexts, behavioral objectives, target populations and composite specifications.

The conceptual design of the project, the various personnel resources assembled, and the statement of goals for the program, represent the initial and continuing concern of the project: to accommodate the forces of change. The general goals involve five contexts--instructional organization, educational technology, contemporary learning-learning process, societal factors, and research--representing important sources of change in teacher education today. Each of these is discussed below:

The Context of Instructional Organization. The Ohio model's multi-unit school organization comprises administrative teaching functions and support functions reorganized into flexible units of cooperating and consulting groups. Staff roles in the multi-unit school (See Figure on next page) involve:

- The principal as a group leader, executive supervisor, and evaluator of programs.

ORGANIZATIONAL CHART OF A MULTIUNIT OF 600 STUDENTS

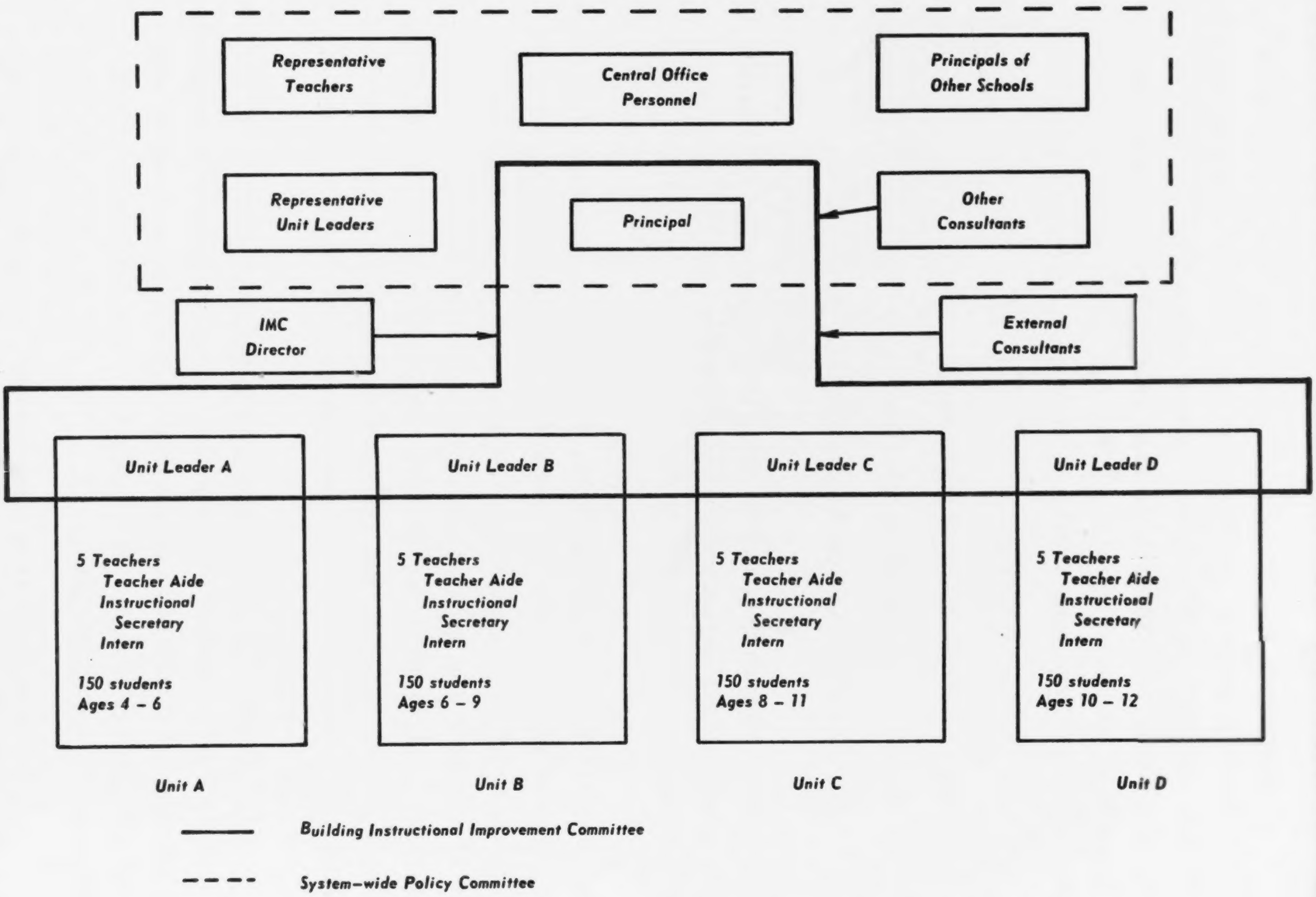

Representative Teachers
Central Office Personnel
Principals of Other Schools
Representative Unit Leaders
Principal
Other Consultants
IMC Director
External Consultants
Unit Leader A
5 Teachers
Teacher Aide
Instructional Secretary
Intern
150 students
Ages 4 – 6
Unit Leader B
5 Teachers
Teacher Aide
Instructional Secretary
Intern
150 students
Ages 6 – 9
Unit Leader C
5 Teachers
Teacher Aide
Instructional Secretary
Intern
150 students
Ages 8 – 11
Unit Leader D
5 Teachers
Teacher Aide
Instructional Secretary
Intern
150 students
Ages 10 – 12
Unit A
Unit B
Unit C
Unit D
Building Instructional Improvement Committee
System–wide Policy Committee

Figure 17

- A unit leader whose leadership role includes membership on an Instructional Improvement Committee, teaching, structuring programs, and methods and curriculum development.
- The teacher participates in all relevant school functions, contributes according to specialized training and interests, and works as an agent in individually guided instruction.
- The intern, typically fully assigned for one semester, engages fully in professional activities.
- Instructional secretaries and teacher-aides perform routine clerical and instructional work and assist in one-to-one, small group and independent activities.

The Context of Educational Technology. Systems concepts can be used to describe the school. An individual school building can be considered a functioning system containing definable inputs (students, teachers, information, finances, goals, etc.) and outputs (educated students). The school is made up of components (teaching units, facilitating units, administrative units, etc.) which operate in related fashion with the purpose of accomplishing a specified goal or set of goals (see Figure 18, next page).

The role of teacher is a key element in this analysis of the steady growth in volume and complexity of inputs into the school. The change is most noticeable in three types of input. There is increasing complexity of educational goals, moving from the three R's toward complete socialization of the child. There is an exponential increase in the volume of information entering the school, and there is pervasive change in student character and normative standards as America shifts from a rural-agricultural society to an urban, post-industrial society.

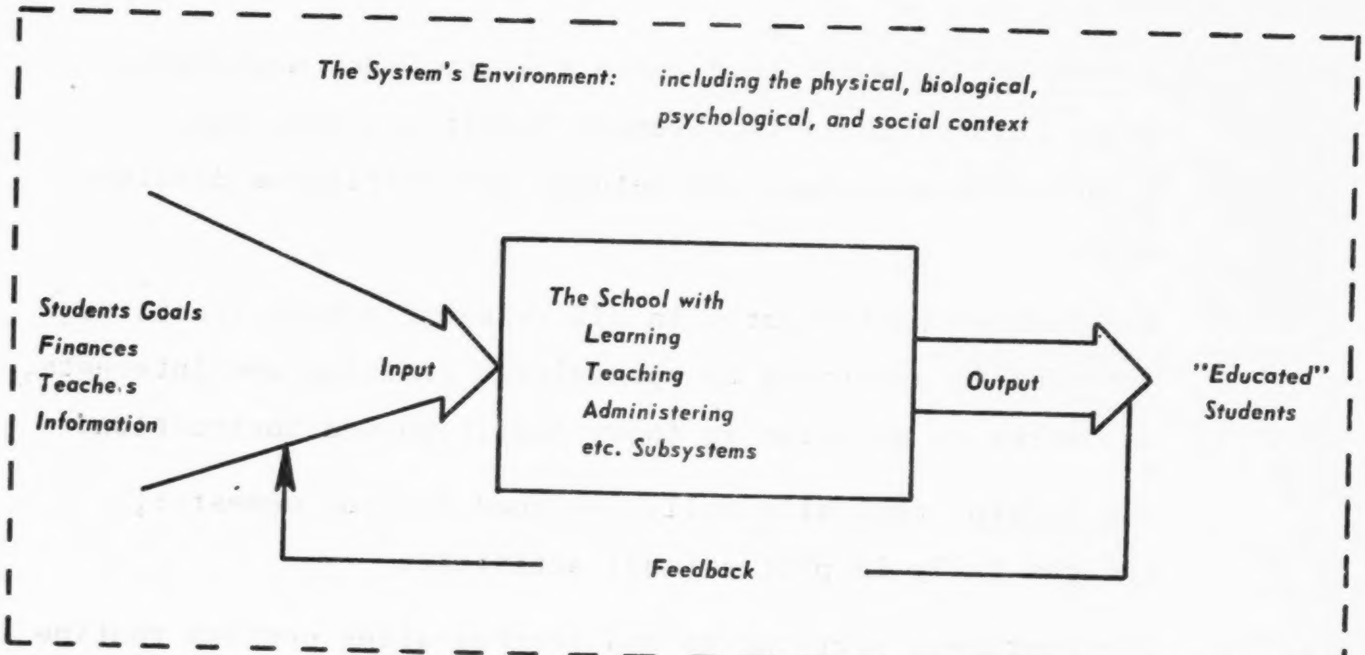

The System's Environment: including the physical, biological, psychological, and social context
Students Goals
Finances
Teachers
Information
Input
The School with Learning Teaching Administering etc. Subsystems
Output
"Educated" Students
Feedback

Figure 18 The School as a System

The Context of the Contemporary Learning-Teaching Process. The context of learning and teaching processes is concerned with developing teaching behaviors that help each child toward the program's ten goals including both cognitive and affective-service goals. New organizations of the classroom and of educational procedures will permit better use of families of learning theories, including both conditioning theories and imitation conceptions.

The Context of Societal Factors. The major themes of current social affairs are relevant to teacher education. These themes include:

- The inability of world leadership to achieve peace.
- The elusiveness of social and personal adjustment due to technology, racial unrest and poverty.
- The failure to support education due to social valuations.

The international-ideological conflict involves American democracy, American social values and especially the American youth. The conflicts change the educational contexts. A related difficulty is that the selection of a teaching career is often not based on interest or ability, but rather on social expediency.

Teacher militancy, political factors, and irrelevant curriculums have impact on teacher education. Personal and social adjustments are seriously impeded by expanding racial chaos, population mobility, poverty, urban ghettos, and the failure of the schools to contribute to a realistic and factual view of the place of education and social affairs.

The Context of Research and the Goals of Teacher Education. A modern teacher education program may be based on research basic to three questions.

- What behavioral skills are necessary to the effective teacher?
- What student characteristics are required to acquire the behavioral skills of an effective teacher?
- What are "efficient" training experiences?

A theoretical model for the study of teaching may be constructed of N dimensions describing Y characteristics of teachers in a "behavior space." The model is useful as an aid to visualization. By manipulating training experiences relevant to student characteristics, an effective model of processes can be evolved. Any model for teacher training, however, should stress the development of an attitude of experimentation based on theoretical knowledge, technical skill, and feedback techniques. A theoretical model will also prescribe research and evaluation activities involving the collection and organization of data to improve the teacher education model.

Curriculum Design

A partnership representing the combined efforts of the project staff consultants and an independent educational consulting agency generated over 2,000 behavioral objectives. The process used by curriculum designers was to secure a breakdown of each context into major subject areas which were divided into topics. Behavioral objectives were then prepared for topics under each of the six target populations.

Preparing Objectives. A private consulting firm prepared behavioral objectives using these procedures: (1) for each of the five contexts, major subjects were listed for each principal target population; (2) each subject was further subdivided into topics, and for each topic a list of relevant source materials was compiled along with a list of desired teacher behaviors; (3) from this information a total of 2,123 objectives were written; and (4) of these, 1,411 were retained on the basis of project staff judgments.

Organizing Specifications. The 1,411 selected behavioral objectives were organized into 818 educational specifications, represented in coded information on punched cards. Classes of treatments, materials, and evaluation techniques serve in indexing the specifications, along with target population, context, major subject area, and topic.

Organizing for Implementation. The organization for implementation allows 818 specifications to be processed to permit selection, rejection, ordering and reordering according to the population to be served. A coding process permits rapid collection of all specifications pertinent to one target population. Any number of specifications may be grouped by context. Figure 19 gives an example of how this can be done.

EXAMPLE OF COMPOSITE SPECIFICATIONS BY CONTEXT

Figure 19.

	Identified Contexts					
Target Population	Instructional Organization	Educational Technology	Learning-Teaching Process	Societal Factors	Research	Total
Pre-School	157	60	102	74	67	460
Elementary	151	75	102	69	67	464
In-Service	144	85	113	91	77	510
College & University	79	93	96	65	116	449
Administrative	62	70	103	126	77	438
Supportive	22	71	-	28	-	121

For special purposes, sets of completely new programs of teacher education may be provided, permitting easy access to groups, needs, and special interests. Programs for such special purposes require necessary agreement upon general goals and specific objectives. Topics may be identified in these contexts using varying numbers of specifications. Such programs might be offered as eight-week summer institutes or as prototypes of a new design format.

Institutional Relationships

Groups and individuals from public and private education systems, government, and business organizations cooperated in the formulation and review of the Toledo Model. Actual development was accomplished by a consortium of 12 State Universities of Ohio. The work was centered at the University of Toledo, which initiated, compiled, and coordinated the work of producing the model. Project staff was recruited mainly from the University of Toledo, the Ohio State University, and Ohio University. Agencies cooperating included the Toledo Public Schools, the University of Wisconsin's

Research and Development Center, the Michigan and Ohio Regional Educational Laboratory, and various private agencies. The model authors selected education goals that were designed and developed by the Pennsylvania State Department of Education and the Educational Testing Service.

Innovative Features

The influence of innovation on the work of the Toledo project is manifested in two ways. First, the model's curricular content represents new areas and new information about elementary education. Second, a new school organization is proposed, dedicated to continuous curriculum renewal through on-going research and development. The proposed organization, a Multi-unit School, features new alignments of staff, new positions within the school, and new ways to group students.

Additional innovation represented in the Toledo project is in the use of a general file of educational specifications. This file serves as a basis to custom-build teacher education curricula for specific target populations.

Student Guidance

Guidance of the student in the Toledo model is achieved through two processes. First, the process of selecting the educational specifications for a model program may be tailored to a particular target population. Second, the contexts of instruction include both subject-matter and pedagogical content. Guidance may be achieved through the organization of these contexts to serve student needs, particularly by adjustments in instructional organization, contemporary learning-teaching processes, and societal factors. It is the integration of subject-matter with methodology that will allow students to gain a realistic perspective of their own particular intersts and talents.

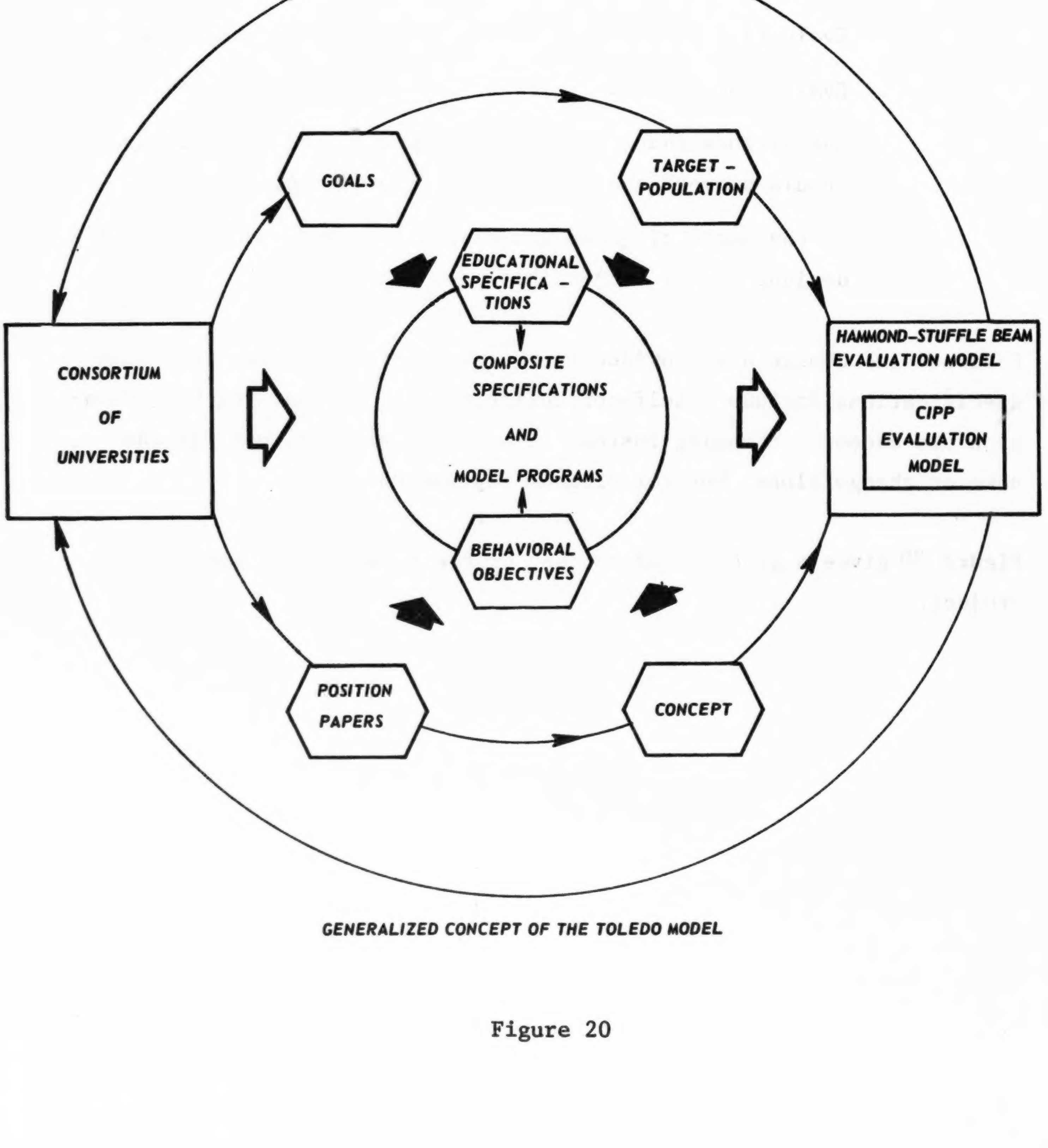
Management and Control

Evaluation in the Toledo model was designed to insure that four conditions would be met:

- Evaluation information should enhance decision-making.
- Evaluations should be valid, objective, and economical.
- Evaluations should be based on generalized principles or should support specific types of decisions.
- On the basis of generalized sets of steps, many evaluation designs should be possible.

Feedback and change are provided by the evaluation process. The Ohio specifications include a self-correcting aspect, so that teacher education can become a changing instead of a static process, not for the sake of change alone, but for program improvement.

Figure 20 gives a generalized concept of the total Toledo model project.


GOALS
TARGET - POPULATION
EDUCATIONAL SPECIFICA - TIONS
CONSORTIUM OF UNIVERSITIES
COMPOSITE SPECIFICATIONS AND MODEL PROGRAMS
HAMMOND-STUFFLE BEAM EVALUATION MODEL
CIPP EVALUATION MODEL
BEHAVIORAL OBJECTIVES
POSITION PAPERS
CONCEPT

GENERALIZED CONCEPT OF THE TOLEDO MODEL

Figure 20

THE WISCONSIN ELEMENTARY TEACHER EDUCATION PROJECT (WETEP)

Overview

The Wisconsin Elementary Teacher Education Project (WETEP) is designed to create new patterns for teacher education by assembling the pieces of an educational revolution, rapidly alterning procedures in higher education, continually improving technological resources, innovative approaches which improve the quality of the student-teacher relationship, and emphases which give continuing hope for effective individualization of instruction. WETEP represents a step in the evolution of the Wisconsin elementary teacher education program which has been in a continuing process of change for the past twenty years. The effort is briefly characterized as experimental, emphasizing continuous clinical experience, an interdisciplinary faculty, and internship in schools organized for team teaching.

Major Themes

The WETEP model envisions a future education more relevant to the learner's continuing and future needs than that presently offered in the age-grade oriented schools of today. The present single pattern of school success through achievement in academic subjects will be expanded. The goal of WETEP is to create a climate for the development of those characteristics which may have even more importance for the citizens of the future than for those of the present. The school will change to accept a value orientation rather than a materials orientation, to become sensitive and reactive to continuing social problems, to be sufficiently people-oriented to meet the demands of high density populations and increased travel and intercultural interaction, to use leisure time creatively, to develop intellectual competencies for occupational roles, and to be sufficiently oriented to scientific-technological developments and processes to appreciate and recognize their contributions to and limitations on the educational process.

The key goal in designing the new elementary school will be individualization, based on the specifications of objectives in behavioral terms. The goals, however, will be tailored to individual differences of children. These differences may be expressed in background and in experience, in ability and in aptitudes, and in styles and rates of learning. To achieve this goal, the entire range of instructional media, from new technological instruments to conventional textbooks, offers decision-making challenges about their effective use. A systems approach which optimally employs teachers and machines helps assure that these media are used to maximum effectiveness. A multi-media approach to instruction provides new opportunities for individualization through facilitating personal choices dictated by the child's own interests and needs.

The ability of modern electronic computers to store and make use of large quantities of information about individuals creates a potential for individualized instruction. The task will be to develop a system in which three elements--teachers, materials, and computers--are orchestrated to achieve the goal of individualization. The computer may be used to compile a diagnostic appraisal or assessment of the relevant backgrounds, abilities, interests, and learning styles of each child, as a basis for determining individual learning goals. It will also be useful as an information storage device, for use in problem-oriented games and simulations, and for drill and practice.

Although the schools of tomorrow will be media-centered and computer-facilitated, the Wisconsin model insists that it is only in full concert with the human dimension of the classroom environment that the effectiveness of technology can be fully realized. Any proposal for schooling in 1975, therefore, must inevitably involve a creative and effective melding of teacher, materials, and technology in a way which optimizes personalized opportunities for pupils. Imaginative planning is imperative for a vastly different kind of educational experience for all children in 1975.

Since the major goal for the elementary school is the individualization of instruction, the organization of teaching personnel must be geared to meet this objective.

Instructional Goals

Innovations underway in curriculum development, in individualization of instruction, and in patterns of technology in the schools are accompanied by new patterns of school organization. These changes are causing the development of new roles for teachers. It may be anticipated that those activities which today occupy a major portion of the teacher's time will not have a similar priority in the future. Four priority roles are now recognized: (1) information transmission, (2) management and administration, (3) guidance, and (4) modeling. In schools beyond 1975 it may be expected that this order of priorities for teacher roles will be in precisely the opposite order. Teachers will serve primarily as models and as guidance counselors and only incidentally as managers and administrators. They will seldom serve as processors of information to be transmitted to learners. The primary goal of the WETEP program, therefore, will be to produce a teacher model; that is, someone who teaches by demonstrating through his own behavior a commitment to the processes of inquiry and learning.

Overall Program Organization

A cybernetic system was designed to portray the interrelationships of the integral parts of WETEP. The system contains four basic components (1) an input component which provides for the selection and entrance of appropriate teacher education candidates; (2) an operations component which provides for the teaching-learning experiences of the students; (3) an output component which consists of the intern experience and the full-time teaching career for the WETEP certified teacher; and (4) a feedback component which supplies the control and guidance of students progressing through the system and the continual assessment of the system itself.

The WETEP program will prepare elementary school teachers for children from age 3 through grade 6. For the first two years, the student will be enrolled in the College of Letters and Science. Major emphasis during the freshman and sophomore years will be placed upon the basic bachelor degree requirement. Late in the sophomore year, a student may apply for admission to the introductory component of WETEP. Teacher education at the University of Wisconsin properly consists of a broad liberal education; foundation work in the historical, sociological, philosophical and psychological backgrounds of American education; and professional orientation and methodology in teaching. In developing programs for liberal education purposes, the School of Education looks to those departments and professors whose primary attention is given to the basic courses in liberal arts and sciences provided for all University students. Subject-matter departments assume responsibility for proposing major and minor programs of specialization. Similarly, the pedagogical departments (Curriculum and Instruction, Educational Psychology, Educational Policy Studies, etc.) give leadership to the professional sequence provided for teachers.

WETEP is designed to provide for the education of teachers from the time of their admission to the professional education program to the time of their retirement (WETEP also makes provision for experienced teachers to enter the program). In-service education will be provided both on campus as a part of graduate level work and in WETEP schools. In-service work will also be available via technologically transmitted and controlled instructional modules and through participation in curriculum development projects related to WETEP schools. In-service education will be a continuing aspect of the relation between the schools and the on-campus faculty and facilities.

The input component obtains information concerning the person applying for entrance into teacher education, his characteristics, behavior, and background experiences in order to make possible the following functions:

- A screening function to answer the question, Who is admitted and who is not admitted into the system?
- A diagnostic function to answer the question, What are the needs and interests of the student?
- A predictive function to answer the question, What estimate can be given at this point for a student's probable success as a teacher, and how much confidence can be placed upon the estimate?

The teaching-learning component fulfills the pre-clinical purposes and tasks designed to prepare candidates to work with pupils.

- It answers the question, What studies, experiences, and sequential teaching-learning patterns does the system provide to effect quality teaching behavior in the student?

The application of available and specially designed technical aids in this component can help overcome the inflexible scheduling of professor-class relations by using such techniques as the programming of immediate feedback and the branching of teaching-learning sequences. The possibility of using self-controlled dial-access systems is being explored. The student would use a computerized teaching-learning station and request what is desired from program storage. Simulation of classroom situations also recommends itself as a worthwhile technical capabilities and the essential need for such operations in teacher education, and then to plan for effective implementation.

The output component provides for three major functions:

> The first answers the question, What realistic experiences does the system provide so that the student practices more fully the behaviors, responsibilities, and routines of teaching?
>
> The second function of the output component is realized toward the end of the clinical experience. It answers the questions, What recommendations concerning the individual student's abilities and qualifications as a teacher should be given to the student and to those with whom he may seek employment? How can the student's transition from the teacher preparation system to the schools be facilitated and made meaningful in terms of the concerns of the student, the preparatory system, and the schools?
>
> The third function is concerned with the close relationship, throughout the output activities, between those working in the teacher education

> program and those in the elementary schools. It answers the question: How can better communication and cooperation be developed between teacher educators, school administrators and teachers, and those in state departments of education?

For the first function, the output component should provide extended clinical experiences in actual classrooms where the student carries much responsibility for actual teaching-learning operations. It goes beyond the previous exposure to classroom situations and settings which was provided through simulated conditions, multi-media experiences, and short-term classroom experiences in the teaching-learning component. Now the student becomes involved in a classroom or classrooms as a responsible teacher, one who must become familiarized with each pupil as an individual learner, plan teaching strategies, develop learning and evaluative materials, and work cooperatively with colleagues.

As its second function, the output component provides more than a placement service for students completing the teacher education program. Finding graduates a teaching position and helping school districts fill their vacancies are important services. However, by the time a student's clinical experiences are nearly completed, the information accumulated for the student throughout the system could be assessed as a whole by a panel of teacher educators and the student. It is assumed that this assessment would rarely be held to consider the failure and dismissal of a student. At this point, the student should expect to graduate and receive a teaching certificate, but where to teach requires special consideration.

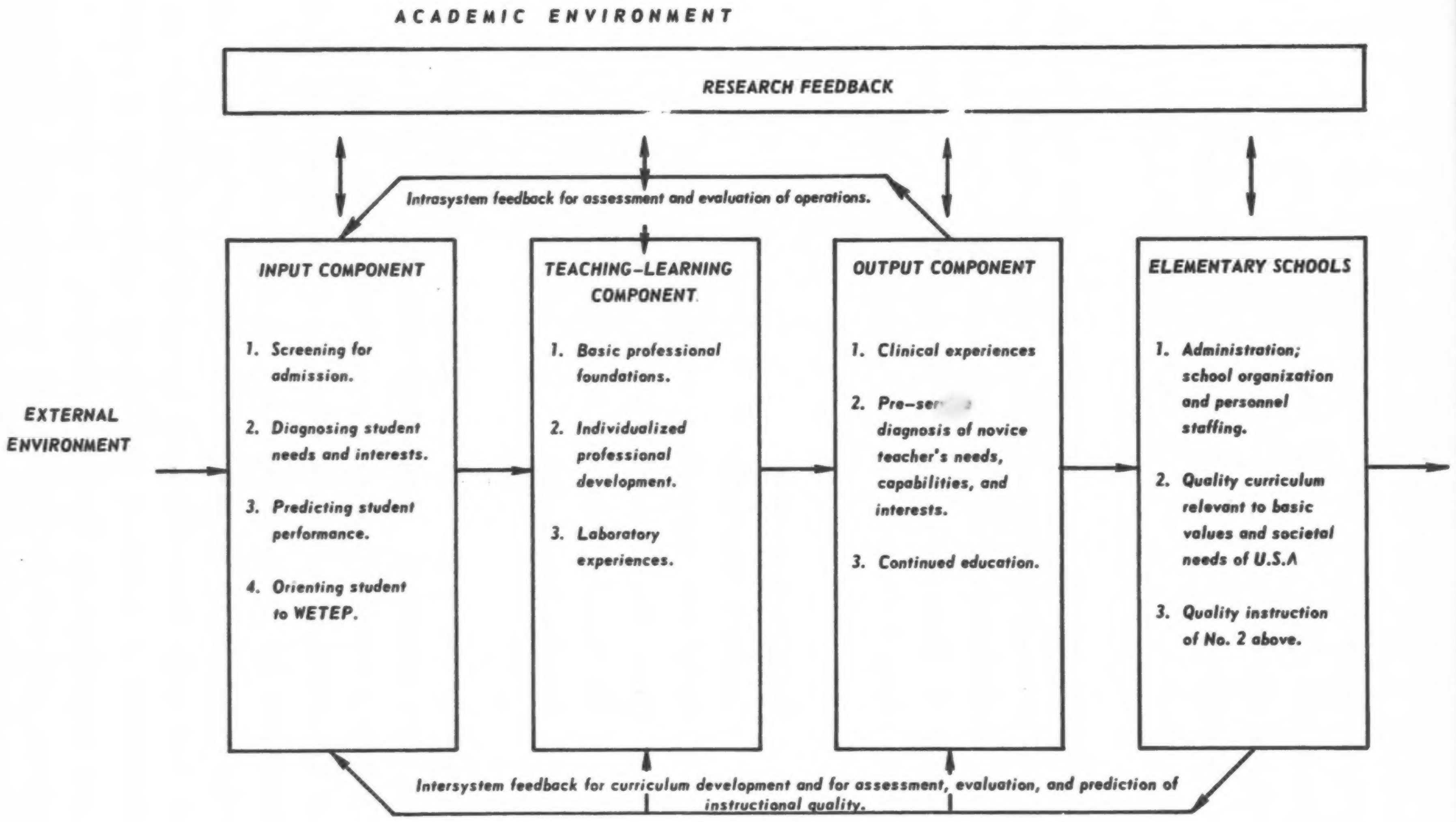
In present teacher education programs, nothing approximates the third output function as it is explained above. There is no structure for such communication and the necessary information is completely lacking. To satisfy the functions of the output component, close working relations need to have been developed between academic, school, and state personnel in the developmental functioning of previous components. Such relations are highlighted in the output component because of the existing connections between the three institutions at this crucial point in programs of teacher education.

The feedback component establishes an information and adjustment system for the program. It provides an information base for determining the effectiveness of the program's operation. Teacher education programs typically function without systematic feedback components. They tend to have inefficient methods of providing feedback to students, no self-regulation procedures for learning sequences, nor methods of assessing the effectiveness of the program or the graduate. To be an effectual and self-improving organization, a teacher program must be developed with feedback processes which provide relevant information for diverse purposes. Immediate feedback for students' learning at the "microcriterion" teaching-learning operation is required, as well as assessments of student progress at critical points of the program.

The interrelationship of the four components which form the basic cybernetic model of WETEP is described in Figure 21.

Curriculum Design

The basic content of an elementary teacher education program includes introductory studies in education, study of principles of human growth and learning, and study in subject areas. WETEP meets these needs through the following structured elements:


ACADEMIC ENVIRONMENT
RESEARCH FEEDBACK
Intrasystem feedback for assessment and evaluation of operations.
EXTERNAL ENVIRONMENT
INPUT COMPONENT
1. Screening for admission.
2. Diagnosing student needs and interests.
3. Predicting student performance.
4. Orienting student to WETEP.
TEACHING–LEARNING COMPONENT
1. Basic professional foundations.
2. Individualized professional development.
3. Laboratory experiences.
OUTPUT COMPONENT
1. Clinical experiences
2. Pre–service diagnosis of novice teacher's needs, capabilities, and interests.
3. Continued education.
ELEMENTARY SCHOOLS
1. Administration; school organization and personnel staffing.
2. Quality curriculum relevant to basic values and societal needs of U.S.A
3. Quality instruction of No. 2 above.
Intersystem feedback for curriculum development and for assessment, evaluation, and prediction of instructional quality.

CYBERNETIC MODEL FOR WETEP

Figure 21

Orientation
Educational Psychology
Communications
Mathematics Education
Science Education
Social Studies
Art Education
Health Education
Safety Education
Music Education
Physical Education
Curriculum and Instruction

While WETEP incorporates current and projected individual and social needs in each of the above elements, additional areas have been chosen to receive explicit attention because of high national priorities. The number and nature of these elements may be expected to change in the future as social needs dictate. Those presently included in WETEP are:

Leisure Education
Guidance Education
Media and Technology Education
Early Childhood Education
Culturally Diverse Education
Special Education

For each of these content areas and for the areas of special concern a position paper has been prepared. These papers detail the curriculum organization following a common format of organization and design. First, a hierarchical taxonomy of objectives and activities, beginning with the broad functions of the model system, is used to organize, classify, and define *what* is to be learned and *how* it is to be learned. The model assumes that only observable and measurable behavior is unambiguous and unequivocal in terms of objectives, activities to effect the objectives, and procedures to evaluate results. The system's objectives, therefore, are certain observable and assessable cognitive, affective, and psychomotor behaviors. For the students to achieve such behavioral objectives, the system provides them specific performance activities or operations in proper sequences. Since objectives and operations are systematically conjoined, they are referred to as objectives-operations. As a system for organizing and sequencing objectives-operations, from the micro-system to the micro-system level of concern, and to maintain interrelationships among the levels, the model presents the following schema:

The overall system is defined as a total, time-variant arrangement of input, modification, and output objectives-operations with feedback control and guidance processes, i.e., a teacher education system. The overall system has been organized around major components, each of which represents a major set of system objectives-operations dealing with either input, teaching-learning, or output concerns. The fourth major component of the WETEP model is the feedback component. In turn the components have been classified into basic elements, that is, a subset of a component identifiable by interrelated objectives-operations and system controls. Each content area or special interest listed above represents an element.

Each element is organized into subelements, that is, subsets of an element dealing with specific sets of closely interrelated objectives-operations, for example, learning to teach reading is a subelement of the Communicative Arts element.

Within each subelement, subject matter is further subdivided into modules, each of which contains the following sequence of instructional activities:

- A prospectus: A preview of the modular content and its educational relevance.

- A pretest: An instrument to assess the student's subject-matter proficiency, i.e., adequacy of preparation or need for supplementary study.
- The instructional unit: An organized presentation of content designed to achieve the objectives of the module.
- A posttest: An instrument to evaluate the student's mastery of modular material.

The order or sequence in which students may study the content of different modules is determined on the basis of four interlocking considerations: (1) special prerequisites for certain modules; (2) objectives of other WETEP elements; (3) professional advice or counselor recommendation; (4) student's personal choice where elective options are available.

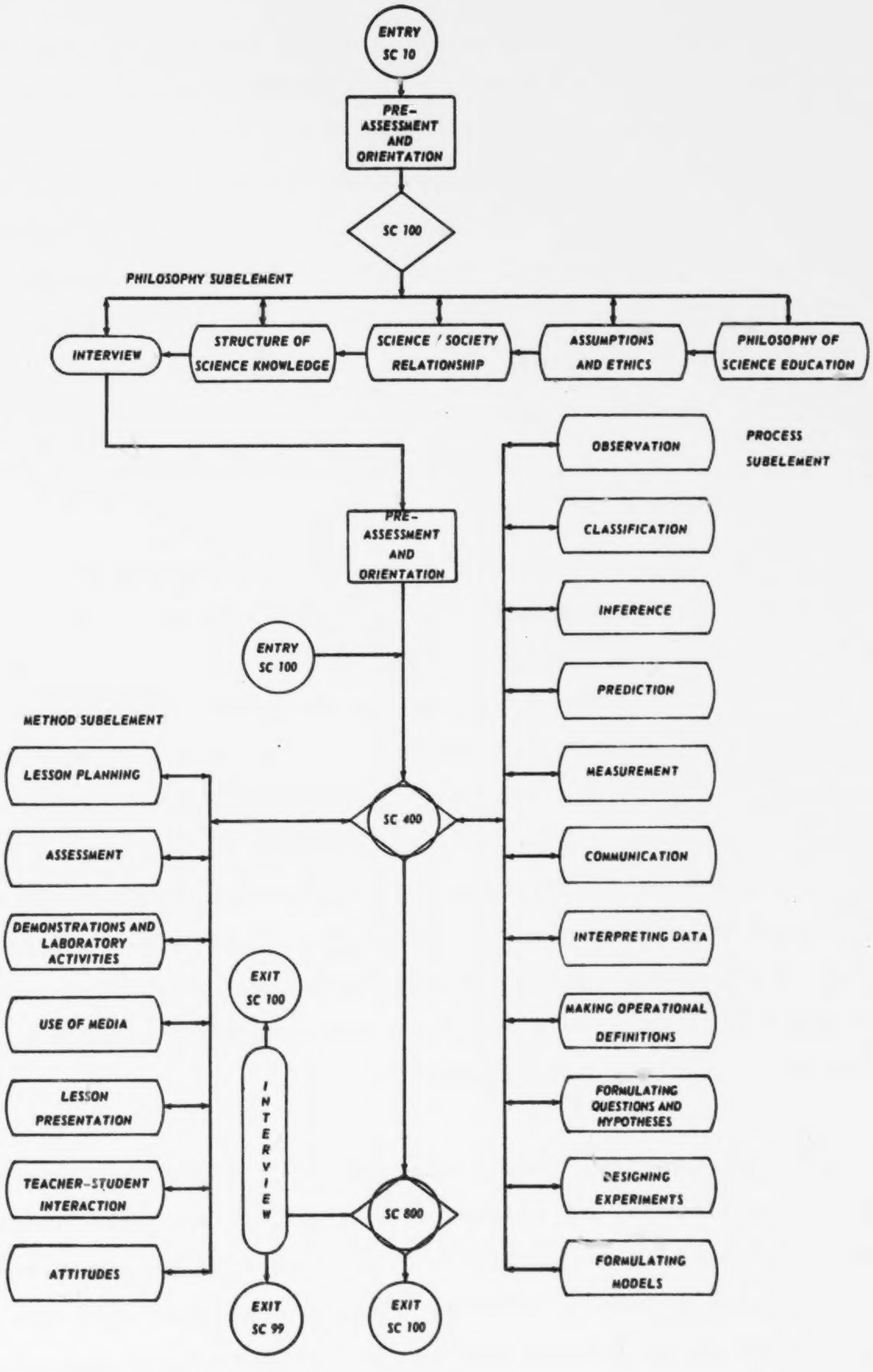
Access to each module may be gained by passing through a basic introductory module, by showing evidence of previous mastery as indicated by attainment profiles, or by successful performance on preassessment instruments. The modules are organized on a continuum distinguished by three levels, ranging from the general to the specialized. The general level includes survey material, generalizations, and data which introduce students to basic introductory content. The second level modules offer more specific knowledge and introduce sophisticated analyses. The third level modules are highly specialized and are designed to meet particular needs of individual students. Modular content is presented using different media and clinical/laboratory experiences. Where relevant, cognizance is taken of developmental and social class differences.

This curriculum organization presents a means for structuring learning experiences according to a hierarchy of structure and in terms of an information flow process. Figure 22 shows the division of a model science educational element into its basic subelements and indicates the process orientation of the planning. The chief advantages to this format are its capabilities for organizing and processing information through the system. Curriculum experiences can be interrelated within a generalized framework, and the system can be responsive to feedback from a student's experience and the needs of the future teacher.

Institutional Relationships

The University of Wisconsin maintains a pattern of organization for its School of Education that automatically involves all who help to prepare teachers in the making of policies for teacher education. Under this plan the School of Education functions as the overall administrative organization, a type of holding company, to marshal the total resources of the university to educate teachers and to provide research and services to schools. Wide participation in policy making is encouraged and provided, and all departments affected by policies for teacher education are expected to participate in their formulation. This all-institution approach to teacher education makes available the total university resources and facilities for a complete and systematic approach to the preparation of elementary school teachers.

The role of the elementary schools suggested for WETEP involves two major changes in the philosophy of teacher education. First, the preparation of teachers ceases to be a function of only the teacher education institution. The public school system, vitally concerned with the product of WETEP, becomes an active partner in the pre-service preparation of the teachers. Second, the role of the schools is extended to include cooperative efforts in both pre-service and in-service education. These


ENTRY
SC 10
PRE-ASSESSMENT AND ORIENTATION
SC 100
PHILOSOPHY SUBELEMENT
INTERVIEW
STRUCTURE OF SCIENCE KNOWLEDGE
SCIENCE / SOCIETY RELATIONSHIP
ASSUMPTIONS AND ETHICS
PHILOSOPHY OF SCIENCE EDUCATION
PROCESS SUBELEMENT
OBSERVATION
CLASSIFICATION
INFERENCE
PREDICTION
MEASUREMENT
COMMUNICATION
INTERPRETING DATA
MAKING OPERATIONAL DEFINITIONS
FORMULATING QUESTIONS AND HYPOTHESES
DESIGNING EXPERIMENTS
FORMULATING MODELS
PRE-ASSESSMENT AND ORIENTATION
ENTRY
SC 100
METHOD SUBELEMENT
LESSON PLANNING
ASSESSMENT
DEMONSTRATIONS AND LABORATORY ACTIVITIES
USE OF MEDIA
LESSON PRESENTATION
TEACHER-STUDENT INTERACTION
ATTITUDES
SC 400
EXIT
SC 100
INTERVIEW
SC 800
EXIT
SC 99
EXIT
SC 100

Model Science Educational Element

Figure 22

cease to exist as separate and distinct entities. The WETEP internship is the initial teaching experience, with the teacher education institution serving as partner with the school in guiding this activity. Succeeding years simply see the partnership continue in assisting each teacher in the process of achieving the most effective and productive use of his talents.

WETEP envisions three arrangements by which school districts will cooperate with the program. Under the first plan the school districts will provide one or two schools per district to serve in a network of permanent full-participation schools associated with WETEP for purposes of cooperative responsibility in teacher education and in elementary school curriculum development. A consortium of ten of these schools is being developed as a non-profit corporation, Midwest Individualized Learning Systems, to facilitate curriculum development in the schools parallel to the WETEP principles of teacher education. These ten full-participation schools will also serve as exploratory centers in their respective school systems. Additional ghetto and Indian schools will be identified for participation in WETEP in a variety of roles. Each of these districts will be expected to assume responsibilities for providing staff, program, facilities, and other support for the WETEP involvement, including the salaries of WETEP interns.

The second plan permits schools to become involved by providing placements for interns and by being equipped with the technological support of the WETEP telecommunications system. This plan will provide instructional resources for both interns and in-service teachers. The school district will provide space for a Professional Education Room either within the building itself or in some suitable portable classroom space. This classroom will include a two-way CCTV system, a video and audio dial-access capability, and direct telephone interconnection equipment.

The third plan involved use of a mobile classroom system. The plans might be used in conjunction with the present supervisor-visitation program or during junior year observations.

Innovative Features

An integral part of the development of WETEP is the provision for and facilitation of research in teacher education. The strategy used by the WETEP staff in the planning and implementation of this program offers many possibilities for conducting research on both its process and its outcomes. The systems model which essentially enables the staff to manage the flow and the specifications for all parts of the program will facilitate the design of research. Better understanding of total environmental effects on teachers' competence, as well as of the interacting effects among elements, will be sought.

Designs for elementary schools of the 1970's are changing to provide for individualization and for the utilization of technology in education, and WETEP will also provide for these special features. As a part of the planning phase a space and facilities report has been prepared, to form the basis for a new university building. This procedure represents the first time that a building at Wisconsin has been designed as an outgrowth of a new instructional concept.

A comprehensive in-building and inter-building communication system has been planned, and a standardized output terminal configuration has been designed to facilitate communication in all facets of the program. The terminal will transmit both computer and dial-access information output. Standardization in terminal format will optimize the cost effectiveness of the total communications system. The handling of vast amounts of information, from the most basic record keeping to the storage and recall of audio-visual information, will require that technology becomes a key adjunct to the educational program. In addition to enhancing the educational program of future teachers, it will be necessary to develop competence in both students and faculty in the use of technology and media, and the Media and Telecommunication System shown in Figure 23 has been developed to cover both of these aims.

Student Guidance

Student guidance is a function of the input component which provides orienting, advising, and screening experiences in a systematic manner so that the individual and the institution can have confidence that the student will realize maximum personal rewards from teaching. At the same time, information about each student's abilities, interests, value orientation, attitudes, and past experiences with children will have been garnered and will be available to faculty members working with students at subsequent points in the program. In brief, the input component is designed to provide situations in which students can become acquainted with the design and resources of WETEP, develop an appropriate personal instructional plan within WETEP, and begin to think like teachers and to make decisions like those faced by teachers.

The component has been organized into a screening element and an orientation element, although these parts should be understood as belonging to the same process. An initial screening is undertaken prior to the student's entry into the orientation component. A colloquium, a computer-based information system, and an interview with WETEP personnel will provide the student with information about the program and WETEP with the necessary admittance-decision data. Students will be required to have a 2.5 grade average for consideration, and early in the orientation element an instrument devised to assess the personality traits of students will be administered. Consideration will be given to special admittance standards for deviant educational or social profiles.

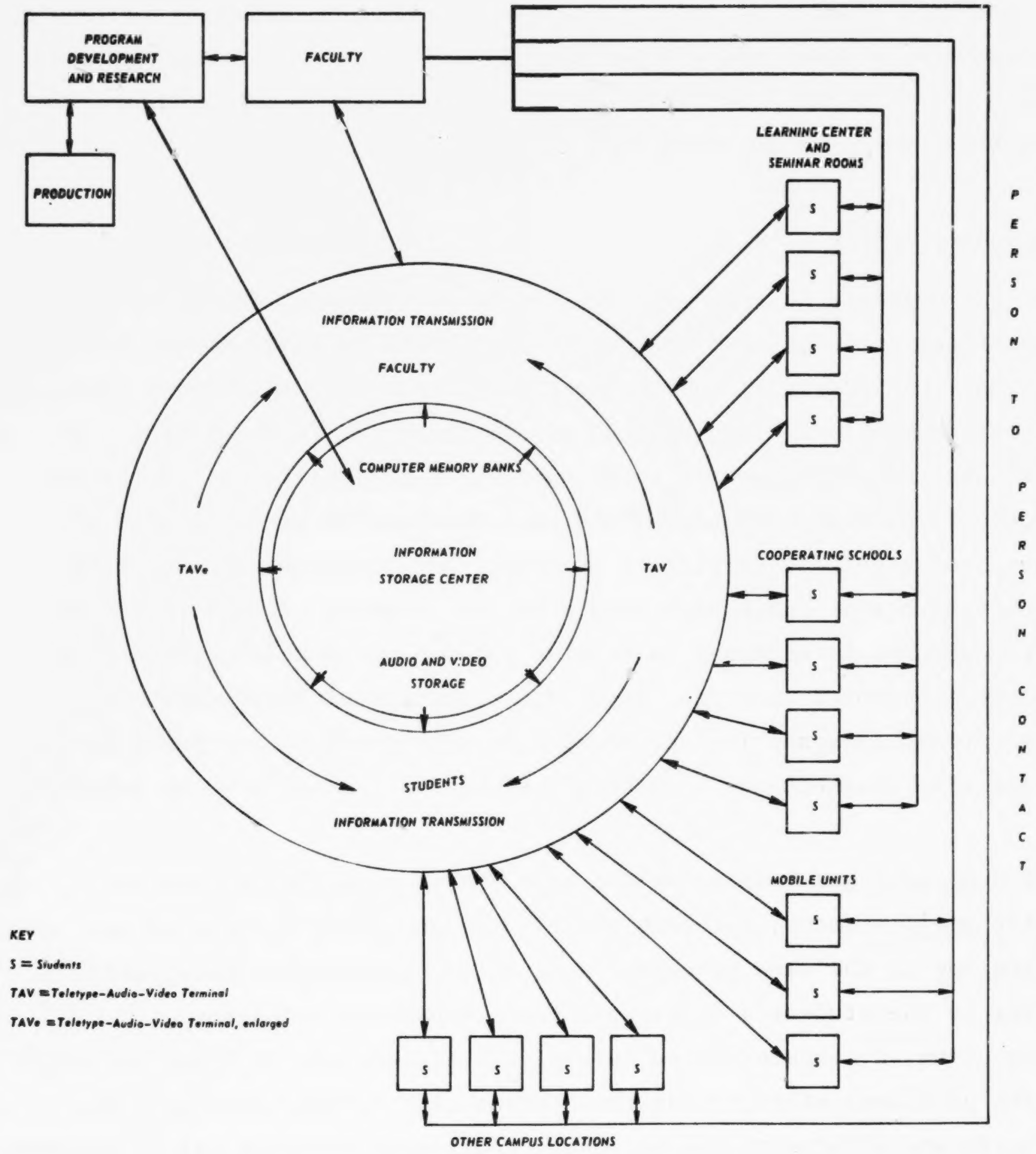

PROGRAM DEVELOPMENT AND RESEARCH
FACULTY
PRODUCTION
LEARNING CENTER AND SEMINAR ROOMS
INFORMATION TRANSMISSION
FACULTY
COMPUTER MEMORY BANKS
INFORMATION STORAGE CENTER
TAVe
TAV
AUDIO AND VIDEO STORAGE
STUDENTS
INFORMATION TRANSMISSION
COOPERATING SCHOOLS
MOBILE UNITS
S
PERSON TO PERSON CONTACT
OTHER CAMPUS LOCATIONS
KEY
S = Students
TAV = Teletype-Audio-Video Terminal
TAVe = Teletype-Audio-Video Terminal, enlarged

Figure 23

Media and Telecommunication System

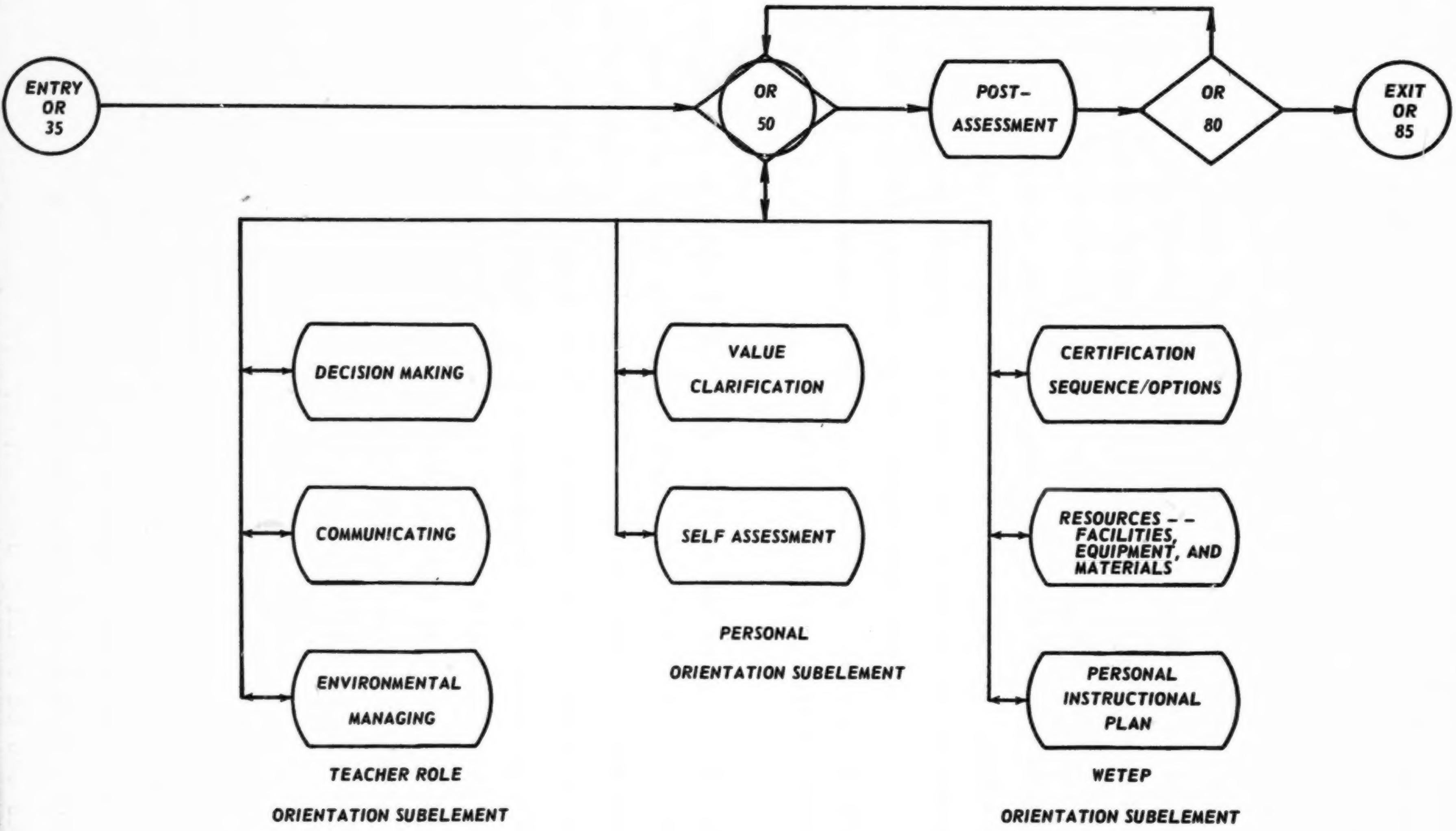
A second screening is undertaken prior to entry into the teaching-learning component. Basic information for this decision includes grade average, speech proficiency, prior experience related to teaching, faculty recommendations, and other test scores. At a convenient point, the instructors of the orientation element and other appropriate personnel make a systematic evaluation of data collected on all enrollees in the course for the purpose of recommending those to be admitted to the school of education. Deficiencies which prohibit admission to the program will be discussed during the interview and a plan for correcting them established. Various campus agencies such as the Reading Service and Speech and Hearing Clinics are available for this purpose.

Although data and evaluations are useful to the staff of WETEP as a means of becoming acquainted with the ability and personality profiles of the students, such information is not gathered merely for that purpose. The intention of the accumulation of information from and about the individual student at this time is to share that information with the student. Faculty members together with the student examine the student's biographical data, his value system, his aptitudes, etc., and derive from such inquiry certain insights and interpretations. While the primary goal of such an exchange is to increase the staff's comprehension of the student and the student's comprehension of himself, a critical secondary goal is the student's experience in self-analysis through inquiry (e.g. through guidance he becomes able to discover and formulate his system of values which forms the basis for his attitudes toward others, his behavioral motives and his personality need). It is an early experience for him in becoming cognizant of the means of attaining and helping others to attain self-actualization.

The Orientation Element provides a systematic method for insuring that each prospective teacher becomes familiar with the demands of teaching as a profession and [illegible]'s responsibilities in the role of teacher. The element is designed to provide students with a notion of the elementary school, the population having roles within or associated with it, and the teacher's role. Rather than provide in-depth study and mastery of a limited number of concepts, the students in this element are to be provided with as great a variety of experiences as possible which will depict for them the scope, the responsibilities, and the processes inherent in the elementary teacher role. It is the intent of WETEP to prepare its students for their entry as interns and eventually as full-fledged teachers into what will commonly be a dynamic educational setting. The orientation element provides the chance for the student to relate himself to this picture. Figure 24 shows the components of the program.

Management and Control

A planning programming budgeting (PPB) system will provide the analytic framework for economic review of WETEP. The nature of WETEP makes the PPB approach particularly well suited to the planned analyses. First, WETEP serves a need in the public sector--education--and as such must be concerned with the optimal allocation of resources in the public domain. By requiring the separation of goal specifications from policy problems, program budgeting is well suited to the budgeting of public services. Second, WETEP requires a dynamic (on-going) assessment of a dynamic program to facilitate analysis of a long-term, flexible program. The use of long-range horizons in PPB analysis will insure continual change and feedback. Third, WETEP specifies goals for program elements in terms of behavioral objectives. Program budgeting requires that a cost-effectiveness analysis must be directed to a determination of optimal means of meeting specified objectives.


ENTRY OR 35
OR 50
POST-ASSESSMENT
OR 80
EXIT OR 85
DECISION MAKING
COMMUNICATING
ENVIRONMENTAL MANAGING
TEACHER ROLE ORIENTATION SUBELEMENT
VALUE CLARIFICATION
SELF ASSESSMENT
PERSONAL ORIENTATION SUBELEMENT
CERTIFICATION SEQUENCE/OPTIONS
RESOURCES -- FACILITIES, EQUIPMENT, AND MATERIALS
PERSONAL INSTRUCTIONAL PLAN
WETEP ORIENTATION SUBELEMENT

MODEL OF ORIENTATION ELEMENT

The central purpose of adopting the program budgeting approach to the economic analysis of WETEP is to aid decision-making in the development, implementation, and maintenance phases of WETEP. The role of PPB analysis will be to sharpen the intuition and judgment which will provide the basis for decisions; the results of the analysis will not dictate the decisions. To offer maximum benefit, the PPB analysis must present the program in such a way that interactions among relevant variables within the program and program alternatives are clearly specified. To fulfill this requirement the final presentation of a program budget must clearly indicate the nature of the program, the means by which it is carried out, and the feedback mechanisms which provide for continual program modification. The next phase of the program development will address each of these needs, describing structural aspects, analytic process considerations, and information system consideration for WETEP.

Assessment of the WETEP program will be undertaken through a program of testing which will provide effective and continuous diagnostic and prescriptive feedback for each student, and this program will present a radical departure from current methods of test construction. In WETEP sequential branching tests will be presented to students at remote terminals under the direction and control of a central processing unit. The use of computer-based testing will eliminate mass testing administration: Each student will be tested on an individual basis at his own speed and convenience at one of the teletype-audio-visual terminals.

Assessment of students in the WETEP system will begin in the input component where University records will be interrogated to obtain information on the student's abilities, experience and educational goals. This information will be continually updated as students progress through the modules. Thus, at any point a student's progress and readiness for other modules can be readily determined. The prerequisites for any module will be assessed by interrogating the experience record and, if necessary, administering an individualized diagnostic test. Within a module, curriculum embedded measurement procedures will monitor the student's progress and provide diagnostics to the instructor and the student.

An obvious first step in the implementation of computer-assisted testing for WETEP will be the development of the assessment procedures required by individual curriculum modules. As the modules are developed, both the prerequisites and the educational goals will be clearly stated in behavioral terms; thus the assessment needs are potentially evident, and the first step toward implementation has been taken. In many modules all or part of the assessment can be done by means of computer-assisted testing.

An interesting possibility for assessment within WETEP is both the general evaluation and the more specific evaluation available at the request of the student or his faculty advisor. There is no reason why sequential tests could not be used at any time to give a student an indication of where he stands relative to his educational goals. The student could request reevaluation in a particular subject matter area or he could request more comprehensive evaluation over a large number of interrelated areas. The measurement strategies for the voluntary testing might be quite different from those which are an essential part of the instructional system. In the voluntary testing procedures, for example, test length might be decided by the student. It should be possible to develop a way of communicating to the student the confidence he can place in a given score, then allowing him to decide if he wishes greater precision.

Placement and Follow-Up

Placement and follow-up will be accomplished through the network of participating school districts. The effective assimilation of interns into the staff will require new patterns of involvement between the local school and the university. The participating schools will be concerned with staff development to fulfill roles in pre-service education, in-service education and curriculum development as part of one continuum.

At any time during his professional career, the in-service teacher will have the opportunity to request assessment of his competencies as a teacher. On the basis of this assessment he may embark on a program of upgrading, using the total facilities of WETEP through the telecommunication network.

Individual study and self-improvement can be carried out by independent study, using the library, dial-access for stored programs, self-assessment through videotaping and interaction analysis, micro-teaching with the aid of university personnel, and observation of other teachers by video.

Another type of in-service growth program might involve the teacher in research or curriculum development projects. These can be directed by, or carried out with consultant help from, university personnel.

The clinical professor, in partnership with the school principal, helps to direct the teacher into the type of program best suited to his needs. He helps to plan and facilitate his work as he serves as liaison with the university. His role, then, no longer begins and ends with the intern, but is directed in concert with many individuals to the professional growth of all teachers in the school.

Special Features

The Wisconsin model asks the university faculty to use its knowledge, skill, and awareness more effectively to be consistent with modern systems approaches to social organization. To individualize learning, multiple technological resources should be used. The faculty should establish professional education programs that augment the purpose of the entire university: developing moral and social commitment, as well as technical competence. A student-faculty partnership should be reached through mutual evaluation, through using new instructional resources, and through increased interaction with and sensitivity to each other. Each professor, encouraging criticism, inter-class visiting, student interpretation, and integration of the area he has studied, exemplifies the characteristics he expects his students to exhibit.

New patterns of staff relationships will result from new roles cast for researcher-teachers, teacher-programmers, supervisory personnel, college-teaching interns, and program assistants. The university will assist the faculty to engage in self-assessment and in-service education. The result will be improved understanding of adult learning behaviors, of university teaching, and of instructional functions.

As part of his new role, the professor should view modern technology positively, conforming it to this mind-set, rather than letting it shape his mind. Insofar as evaluation is concerned, he should seek new ways to develop potential; it is not his function to limit those who would learn.

LIST OF AVAILABLE PUBLICATIONS

National Center for Educational Research and Development
ELEMENTARY TEACHER EDUCATION PROJECT

Copies of these nine reports are now available from the Government Printing Office (The Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402) and available both in hard copy and on microfiche from the Educational Resources Information Center (EDRS, The National Cash Register Company, 4936 Fairmont Avenue, Bethesda, Maryland 20014).

The reports are available at the following prices:

	GPO Reprint		ERIC	ERIC	
Report By:	Order No.	Price	Document No.	Hard Copy	Microfiche
Syracuse University	FS 5.258:58016	$4.50	--- ---	------	-----
Volume I	--------------	----	026 301	$14.85	$1.25
Volume II	--------------	----	026 302	13.55	1.25
University of Pittsburgh	FS 5.258:58017	2.50	025 495	10.60	1.00
Florida State University	--------------	----	--- ---	-----	----
Volume I	FS 5.258:58018	2.00	(SP 002 424)*	8.70	.75
Volume II	--------------	----	--- ---	-----	----
University of Georgia	FS 5.258:58019	3.50	025 491	14.85	1.25
Summary	--------------	----	025 492	1.50	.25
Northwest Regional Educational Laboratory	FS 5.258:58020	6.50	--- ---	-----	----
Overview and Specifications			026 305	7.65	.75
Teachers College, Columbia University	FS 5.258:58021	4.50	(SP 002 427)*	26.95	2.00
University of Massachusetts	FS 5.258:58022	4.50	025 490	26.65	2.25
University of Toledo	FS 5.258:58023	7.00	--- ---	------	----
Volume I	--------------	----	025 457	12.80	1.00
Volume II	--------------	----	025 456	34.85	3.00
Michigan State University	--------------	----	--- ---	-----	----
Volume I	FS 5.258:58024	5.00	(SP 002 428)*	31.35	2.50
Volume II	FS 5.258:58024	5.50	(SP 002 429)*	37.95	3.00
Volume III	FS 5.258:58024	5.00	(SP 002 430)*	29.65	2.25

*This report may be ordered by this temporary number.

Also available are the following related summaries and reports:

- One-page summaries of each of the reports. These may be obtained by writing to the National Center for Educational Research and Development at the address given below.

- "Nine Proposals for Elementary Teacher Education, A Description of Plans to Design Exemplary Training Programs," by Nicholas A. Fattu of Indiana University. This document is a summary of the nine originally proposed programs which were funded in Phase I of the Project. Available through ERIC (see EDRS address above): ED 018 677. Price: $6.55 for hard copy; $ .75 for microfiche.

- "Analysis and Evaluation of Plans for Comprehensive Elementary Teacher Education Models," by William E. Engbretson of Temple University. This document is an analysis of the 71 proposed but unfunded models of Phase I. Available through ERIC: ED 027 268. Price: $12.60 for hard copy; $1.00 for microfiche.

- A self-initiated critique of the Syracuse University model program; "Specifications for a Comprehensive Undergraduate and In-service Teacher Education Program for Elementary Teachers." Available through ERIC: ED 027 276. Price: $7.20 for hard copy; $ .75 for microfiche.

- "Some Comments on Nine Elementary Teacher Education Models" by Harry Silberman of the System Development Corporation. This paper is adapted from remarks made at an AERA conference in November 1968. Available through ERIC: ED 029 813. Price: $ .75 for hard copy; $ .25 for microfiche.

- A comprehensive bibliography of the reference works used in the preparation of the nine reports. Its more than 1,500 entries include both primary and secondary sources on many phases of teacher education. This document is divided into four sections:

  I. The Nature and Training of Teachers
  II. Education and Educational Practices
  III. Educational Psychology
  IV. Educational Technology

  Available through ERIC: ED 031 460. Price: $4.95 for hard copy; $ .50 for microfiche.

- The report of a writers' conference jointly sponsored by the ERIC Clearinghouse on Teacher Education and the AACTE in March, 1968 (in preparation and to be ready by February). The Phase I project directors or their representatives gathered in Washington to discuss the procedures and problems of developing their program models. This document will be available through ERIC.

If you would like to receive further information about the teacher education project, please contact:

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